SEQ ID NO: 35

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AACTTAGGAT TAAAGAACTT TACCGAAAGG TAAGGGGAAA GAAATCCTAA     100
GACTGTAATC ATGTTGAGTC TATTCGACAC ATTCAGTGCG CGTAGGCAGG     150
AGAACATAAC GAAATCAGCT GGTGGGGCTG TTATTCCCGG GCAAAAAAAC     200
ACTGTGTCTA TATTTGCTCT TGGACCATCA ATAACAGATG ACAATGATAA     250
AATGACATTG GCTCTTCTCT TTTTGTCTCA TTCTTTAGAC AATGAAAAGC     300
AGCATGCGCA AAGAGCTGGA TTTTTAGTTT CTCTGTTATC AATGGCTTAT     350
GCCAACCCAG AATTATATTT AACATCAAAT GGTAGTAATG CAGATGTTAA     400
ATATGTTATC TACATGATAG AGAAAGACCC AGGAAGACAG AAATATGGTG     450
GGTTTGTCGT CAAGACTAGA GAGATGGTTT ATGAAAAGAC AACTGATTGG     500
ATGTTCGGGA GTGATCTTGA GTATGATCAA GACAATATGT TGCAAAATGG     550
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CGTGTCTTGG AGCCCTTATA ATCCAAGTTT GGATAATACT TGTTAAGGCT     650
ATAACCAGTA TATCAGGATT GAGGAAAGGA TTCTTTACTC GGTTAGAAGC     700
ATTTCGACAA GATGGAACAG TTAAATCCAG TCTAGTGTTG AGCGGTGATG     750
CAGTAGAACA AATTGGATCA ATTATGAGGT CCCAACAGAG CTTGGTAACA     800
CTCATGGTTG AAACACTGAT AACAATGAAC ACAGGCAGGA ATGATCTGAC     850
AACAATAGAA AAGAATATAC AGATTGTAGG AAACTACATC AGAGATGCAG     900
GTCTTGCTTC ATTTTTCAAC ACAATCAGAT ATGGCATTGA GACTAGAATG     950
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CTCTGGAGTT ATGCGATGGG TGTAGCAGTT GTACAAAACA AGGCCATGCA    1150
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GAAGAACATC AGCAGTTCAG ATACAACCTT TCATAAGCCT ACAGGGGGAT    1350
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AAACAACACA AATCAAACTG AAATAGATGA TTTGTTCAGT GCATTCGGAA    1650
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GAATCCAACC ACAACTCAAT CAACCAAAGA TTCATGGAAG ACAATGTTCA    1800
AAACAATCAA ATCATGGATT CTTGGGAAGA GGGATCAGGA GATAAATCAT    1850
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TCCCAAGAGA ACACGGCAGA CAGCAATGAA ATCAACACAG GAACCACAAG    1950
ACTTAGCACG ACAATCTACC AACCTGAATC CAAAACAACA GAAACAAGCA    2000
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GAACGTGCCA CAGAGACAAA AGATAGAAAT GTTAATCAGG AGACTGTACA    2100
GGGAGGATAT AGGAGAGGAA GCAGCCCAGA TAGTAGAACT GAGACTATGG    2150
TCACTCGAAG AATCTCCAGA AGCAGCCCAG ATCCTAACAA TGGAACCCAA    2200
ATCCAGGAAG ATATTGATTA CAATGAAGTT GGAGAGATGG ATAAGGACTC    2250
TACTAAGAGG GAAATGCGAC AATTTAAAGA TGTTCCAGTC AAGGTATCAG    2300
GAAGTGATGC CATTCCTCCA ACAAAACAAG ATGGAGACGG TGATGATGGA    2350
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Figure 1A

SEQ ID NO: 35

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GGCCAAGAAA GTATCAATCA ACACCCCAGA ACAGTGACAA GGGAATTAAA
AAAGGGGTTG GAAGGCCAAA AGACACAGAC AAACAATCAT CAATATTGGA
CTACGAACTC AACTTCAAAG GATCGAAGAA GAGCCAGAAA ATCCTCAAAG
CCAGCACGAA TACAGGAGAA CCAACAAGAC CACAGAATGG ATCCCAGGGG
AAGAGAATCA CATCCTGGAA CATCCTCAAC AGCGAGAGCG GCAATCGAAC
AGAATCAACA AACCAAACCC ATCAGACATC AACCTCGGGA CAGAACCACA
CAATGGGACC AAGCAGAACA ACCTCCGAAC CAAGGATCAA GACACAAAAG
ACGGATGGAA AGGAAAGAGA GGACACAGAA GAGAGCACTC GATTTACAGA
AAGGGCGATT ACATTATTAC AGAATCTTGG TGTAATCCAA TCTGCAGCAA
AATTAGACCT ATACCAAGAC AAGAGAGTTG TGTGTGTGGC GAATGTCCTA
AACAATGCAG ATACTGCATC AAAGATAGAC TTCCTAGCAG GTTTGATGAT
AGGAGTGTCA ATGGATCATG ATACCAAATT AAATCAGATT CAGAACGAGA
TATTAAGTTT GAAAACTGAT CTTAAAAAGA TGGATGAATC ACATAGAAGA
CTAATTGAGA ATCAAAAAGA ACAATTATCA CTGATCACAT CATTAATCTC
AAATCTTAAA ATTATGACAG AGAGAGGAGG GAAGAAGGAC CAACCAGAAC
CTAGCGGGAG GACATCCATG ATCAAGACAA AAGCAAAAGA AGAGAAAATA
AAGAAAGTCA GGTTTGACCC TCTTATGGAA ACACAGGGCA TCGAGAAAAA
CATCCCTGAC CTCTATAGAT CAATAGAGAA AACACCAGAA AACGACACAC
AGATCAAATC AGAAATAAAC AGATTGAATG ATGAATCCAA TGCCACTAGA
TTAGTACCTA GAAGAATAAG CAGTACAATG AGATCATTAA TAATAATCAT
TAACAACAGC AATTTATCAT CAAAAGCAAA GCAATCATAC ATCAACGAAC
TCAAGCTCTG CAAGAGTGAC GAGGAAGTGT CTGAGTTGAT GGACATGTTC
AATGAGGATG TCAGCTCCCA GTAAACCGCC AACCAAGGGT CAACACCAAG
AAAACCAATA GCACAAAACA GCCAATCAGA GACCACCCCA ATACACCAAA
CCAATCAACA CATAACAAAG ATCTCCAGAT CATAGATGAT TAAGAAAAAC
TTAGGATGAA AGGACTAATC AATCCTCCGA AACAATGAGC ATCACCAACT
CCACAATCTA CACATTCCCA GAATCCTCTT TCTCCGAGAA TGGCAACATA
GAGCCGTTAC CACTCAAGGT CAATGAACAG AGAAAGGCCA TACCTCATAT
TAGGGTTGTC AAGATAGGAG ATCCGCCCAA ACATGGATCC AGATATCTGG
ATGTCTTTTT ACTGGGCTTC TTTGAGATGG AAAGGTCAAA AGACAGGTAT
GGGAGCATAA GTGATCTAGA TGATGATCCA AGTTACAAGG TTTGTGGCTC
TGGATCATTG CCACTTGGGT TGGCTAGATA CACCGGAAAT GATCAGGAAC
TCCTACAGGC TGCAACCAAG CTCGATATAG AAGTAAGAAG AACTGTAAAG
GCTACGGAGA TGATAGTTTA CACTGTACAA AACATCAAAC CTGAACTATA
TCCATGGTCC AGTAGATTAA GAAAAGGGAT GTTATTTGAC GCTAATAAGG
TTGCACTTGC TCCTCAATGT CTTCCACTAG ATAGAGGGAT AAAATTCAGG
GTGATATTTG TGAACTGCAC AGCAATTGGA TCAATAACTC TATTCAAAAT
CCCTAAGTCC ATGGCATTGT TATCATTGCC TAATACAATA TCAATAAATC
TACAAGTACA TATCAAAACA GGAGTTCAGA CAGATTCCAA AGGAGTAGTT
CAGATTCTAG ATGAAAAAGG TGAAAAATCA CTAAATTTCA TGGTTCATCT
CGGGTTGATC AAAAGGAAGA TGGGCAGAAT GTACTCAGTT GAATATTGTA
AGCAGAAGAT CGAGAAGATG AGATTATTAT TCTCATTGGG ATTAGTTGGA
GGGATCAGCT TCCACGTCAA CGCAACTGGC TCTATATCAA AGACATTAGC
AAGTCAATTA GCATTCAAAA GAGAAATCTG CTATCCCCTA ATGGATCTGA
ATCCACACTT AAATTCAGTT ATATGGGCAT CATCAGTTGA AATTACAAGG
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4700

Figure 1B

SEQ ID NO: 35

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CCTGATATCC AACATTGCAA ATCAGGCTAC CCACAGGAGA AAAATCAAAA      4851
ACTTAGGATC AAAGGGATCA CCACGAACCC CGGAAAACAG CCAAACAAAC      4901
CAACACACAA ATCACAGACA AAAAGGAGAA GGCACTGCAA AGACCGAGAA      4951
AAAACAGAAC GCACACAACC AAGCAGAGAA AAGCCAAAGC CCGCCATTCA      5001
CAAACACACC AACAATCCTG CAAACAAGCA CCAAAACAGA GGTCAAAAGA      5051
CAAAGAGCAC CAGATATGAC CATCACAACC ACAATCATAG CCATATTACT      5101
AATACCCCCA TCATTTTGTC AAATAGACAT AACAAAACTG CAACGTGTAG      5151
GTGTGTTAGT CAACAATCCT AAAGGCATGA AGATTTCACA AAATTTCGAA      5201
ACGAGATACC TGATATTAAG TTTGATACCC AAAATAGAGA ATTCACACTC      5251
ATGTGGGGAT CAACAGATAA ACCAATACAA GAAGTTATTG GATAGATTGA      5301
TAATTCCTCT ATATGATGGA TTAAAATTAC AAAAAGATGT AATAGTAGTA      5351
AGTCATGAAA CCCACAACAA TACTAATCTT AGGACAAAAC GATTCTTTGG      5401
AGAGATAATT GGGACAATTG CGATAGGGAT AGCCACTTCA GCACAAATCA      5451
CCGCAGCAGT CGCTCTTGTC GAAGCTAAAC AGGCAAAGTC AGACATAGAA      5501
AAACTCAAAG AGGCTATAAG AGACACAAAC AAGGCAGTAC AATCGATTCA      5551
AAGTTCTGTA GGTAACCTAA TTGTTGCAGT TAAATCAGTT CAAGACTATG      5601
TCAACAATGA AATTATACCT TCAATCACAA GATTAGGCTG TGAAGCAGCA      5651
GGGTTACAAT TGGGAATTGC ATTGACACAA CATTACTCAG AATTAACAAA      5701
TATATTTGGT GATAATATAG GAACACTGAA AGAAAAAGGG ATAAAATTAC      5751
AAGGGATAGC ATCATTATAT CACACAAACA TAACGGAAAT ATTTACTACT      5801
TCAACAGTTG ACCAATATGA TATTTATGAC CTATTATTCA CTGAGTCAAT      5851
CAAGATGAGA GTGATAGATG TTGATTTGAG TGATTACTCA ATTACTCTTC      5901
AAGTTAGACT TCCTTTATTA ACTAAACTAT CAAATACTCA AATTTATAAA      5951
GTAGATTCTA TATCATACAA CATCCAGGGC AAAGAGTGGT ATATTCCTCT      6001
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GGAATTGACA ATAGAATTAA TCAATCACCT GATCAAGGAA TTAAGATCAT      6301
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GAAACAGCCA GAGGCAAACA TAGTAGCAAG GTTACAAATA TCATAATGTA      6901
CACCTTCTGG ACAATAACAT TAACAATATT ATCAGTCATT TTTATAATGA      6951
TATTGACAAA CTTAATTCAA GAGAACAATC ATAATAAATT AATGTTGCAG      7001
GAAATAAGAA AAGAATTCGC GGCAATAGAC ACCAAGATTC AGAGGACTTC      7051
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Figure 1C

SEQ ID NO: 35

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CAATTCAGAG TCATGTTCAA AACTATATCC CACTATCATT AACACAACAA
ATGTCAGATC TCAGAAAATT TATCAATGAT CTAACAAATA AAAGAGAACA
TCAAGAAGTG CCAATACAGA GAATGACTCA TGATAGAGGT ATAGAACCCC
TAAATCCAAA CAAGTTCTGG AGGTGTACAT CTGGTAACCC ATCTCTAACA
AGTAGTCCTA AGATAAGGTT AATACCAGGA CCAGGTTTAT TAGCAACATC
TACTACAGTA AATGGCTGTA TTAGAATTCC ATCGTTAGTA ATCAATCATC
TAATCTATGC TTACACCTCT AATCTTATTA CCCAGGGCTG TCAAGATATA
GGGAAATCTT ACCAAGTACT ACAAATAGGG ATAATTACTA TAAATTCGGA
CCTAGTACCT GATTTAAACC CCAGAGTCAC ACATACATTT AATATTGATG
ATAATAGAAG ATCTTGCTCT CTGGCACTAT TGAATACAGA TGTTTATCAG
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AAACCCATCG GGGAGTGTTG TATCATCAGT AATTCTTGAT TCACAAAAGT
CTAGAGAAAA CCCAATCATT ACTTACTCAA CAGCTACAAA TAGAATAAAT
GAATTAGCTA TATATAACAG AACACTTCCA GCTGCATATA CAACAACAAA
TTGTATCACA CATTATGATA AAGGGTATTG TTTTCATATA GTAGAAATAA
ATCACAGAAG TTTGAATACG TTTCAACCTA TGTTATTCAA AACAGAAGTT
CCAAAAAACT GCAGCTAAAT TGATCATCGC ATATCGGATG CAAGATGACA
TTAAAAGAGA CCACCAGACA GACAACACAG GAGACGATGC AAGATATAAA
GAAATAATAA AAAACTTAGG AGAAAAGTGT GCAAGAAAAA TGGACACCGA
GTCCCACAGC GGCACAACAT CTGACATTCT GTACCCTGAA TGTCACCTCA
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ACAAAAAATT AAACTCAATA AATTAGATAA AAGACAACGG TCAATTAGGA
AATTAAGATC AGTCTTAATG GAAAGAGTAA GTGATCTAGG TAAATATACC
TTTATCAGAT ATCCAGAGAT GTCTAGTGAA ATGTTCCAAT TATGTATACC
CGGAATTAAT AATAAAATAA ATGAATTGCT AAGTAAAGCA AGTAAAACAT
ATAATCAAAT GACTGATGGA TTAAGAGATC TATGGGTTAC TATACTATCG
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TAGCAATATA TCAAATGTTC ACATGACTTA TCAATCAGAC AAATGGTATA
ATCCATTCAA GACATGGTTT ACTATTAAGT ATGACATGAG AAGATTACAA
AAAGCCAAAA ATGAGATTAC ATTCAATAGG CATAAAGATT ATAATCTATT
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TAGATAAACA AAATTACAAT GGGTATATAA TGACTCCTGA ATTGGTACTA
ATGTATTGTG ATGTAGTTGA AGGGAGGTGG AATATAAGTT CATGTGCAAA
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Figure 1D

SEQ ID NO: 35

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AGCAGAAATT TTCTCTTTCT TCCGAACTTT TGGAGACCCT CCATTAGAGG      9750
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TATTGGCGAA TAATATAGGG AAATTCTTCC AAGAGAATGG GATGGTTAAA     10400
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ACAATCTCAA AATATAACCA CCATGATAAA GAATATAACT GCAAGAAATG     11700
TACTACAGGA CTCACCAAAC CCATTACTAT CTGGATTATT TACAAGTACA     11750
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Figure 1E

SEQ ID NO: 35

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GTAGGGATAA GCAGAGGAGG ATTAACCTAT AACTTATTAA GAAAGATAAG
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TAGTCAGTGA CAAGATTAAG TATGAAGATA TGTGCTCAGT AGACCTAGCC
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AAATGGACTT GAAACTCCAG ATCCTTTAGA GTTACTGTCT GGAGTAATAA
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CGAAATATCT TGGATGGAAG CATCACAGAT TGCACAAACA CGTGCAAACT
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ATCACTTATT AGAGTAAGCA GGTTCATCAC AATATCTAAT GATAATATGT
CTATTAAAGA AGCAAATGAA ACTAAAGATA CAAATCTTAT TTATCAACAG
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CCCTTTAAAG GATATAGATC TATCAAAATT AATGGTTATA AGAGATCATT
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ACAGTCTGAT AACTGAATTT CTGACCCTAG ATATACTAGT GTTTCTCAAA
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GAAAATAGAA GGAAGGGATC CCATTTGGGA TTATATAATG AGAACATTAA
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CACATCAGCT GAGGTTATTT GGAGTAAACA GTACAAGTTG TCTTAAAGCT
CTTGAATTAT CACAAATCTT AATGAGGGAA GTTAAAAAAG ATAAAGATAG
ACTCTTTTTA GGAGAAGGAG CAGGAGCTAT GTTAGCATGT TATGATGCTA
```

14100

Figure 1F

SEQ ID NO: 35

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CACTCGGTCC TGCAATAAAT TATTATAATT GTGGTTTAAA TATTAGAGAT    14100
GTAATTGGTC AACGGGAATT AAAAATCTTC CGATCAGAAG TATCATTAGT    14150
AGGTAAAAAA CTAGGAAATG TAACACAGAT TCTTAATCGG GTGAGGGTGT    14200
TATTTAATGG GAATCCCAAT TCAACATGGA TAGGAAATAT GGAATGTGAG    14250
AGTTTAATAT GGAGTGAATT AAATGATAAG TCAATTGGTT TAGTACATTG    14300
TGACATGGAG GGAGCGATAG GCAAATCAGA AGAAACTGTT CTACATGAAC    14350
ATTATAGTAT TATTAGGATT ACATATTTAA TCGGGGATGA TGATGTTGTC    14400
CTAGTATCAA AAATTATACC AACTATTACT CCGAATTGGT CTAAAATACT    14450
CTATCTATAC AAGTTGTATT GGAAGGATGT AAGTGTAGTG TCCCTTAAAA    14500
CATCCAATCC TGCCTCAACA GAGCTTTATT TAATTTCAAA AGATGCTTAC    14550
TGTACTGTAA TGGAACCCAG TAATCTTGTT TTATCAAAAC TTAAAAGGAT    14600
ATCATCAATA GAAGAAAATA ATCTATTAAA GTGGATAATC TTATCAAAAA    14650
GGAAGAATAA CGAGTGGTTA CAGCATGAAA TCAAAGAAGG AGAAAGGGAT    14700
TATGGGATAA TGAGGCCATA TCATACAGCA CTGCAAATTT TTGGATTCCA    14750
AATTAACTTA AATCACTTAG CTAGAGAATT TTTATCAACT CCTGATTTAA    14800
CCAACATTAA TAATATAATT CAAAGTTTTA CAAGAACAAT TAAAGATGTT    14850
ATGTTCGAAT GGGTCAATAT CACTCATGAC AATAAAAGAC ATAAATTAGG    14900
AGGAAGATAT AATCTATTCC CGCTTAAAAA TAAGGGGAAA TTAAGATTAT    14950
TATCACGAAG ATTAGTACTA AGCTGGATAT CATTATCCTT ATCAACCAGA    15000
TTACTGACGG GCCGTTTTCC AGATGAAAAA TTTGAAAATA GGGCACAGAC    15050
CGGATATGTA TCATTGGCTG ATATTGATTT AGAATCCTTA AAGTTATTAT    15100
CAAGAAATAT TGTCAAAAAT TACAAAGAAC ACATAGGATT AATATCATAC    15150
TGGTTTTTGA CCAAAGAGGT CAAAATACTA ATGAAGCTTA TAGGAGGAGT    15200
CAAACTACTA GGAATTCCTA AACAGTACAA AGAGTTAGAG GATCGATCAT    15250
CTCAGGGTTA TGAATATGAT AATGAATTTG ATATTGATTA ATACATAAAA    15300
ACATAAAATA AAACACCTAT TCCTCACCCA TTCACTTCCA ACAAAATGAA    15350
AAGTAAGAAA AACATGTAAT ATATATATAC CAAACAGAGT TTTTCTCTTG    15400
TTTGGT                                                   15456
```

Figure 1G

SEQ ID NO: 36

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ACCAAACAAG AGAAGAGACT TGCTTGGGAA TATTAATTCA AATAAAAATT      50
AACTTAGGAT TAAAGAACTT TACCGAAAGG TAAGGGGAAA GAAATCCTAA     100
GACTGTAATC ATGTTGAGTC TATTCGACAC ATTCAGTGCG CGTAGGCAGG     150
AGAACATAAC AAAATCAGCT GGTGGGGCTG TTATTCCCGG GCAAAAAAAC     200
ACTGTGTCTA TATTTGCTCT TGGACCATCA ATAACAGATG ACAATGACAA     250
AATGACATTG GCTCTTCTCT TTTTGTCTCA TTCTTTAGAC AATGAAAAGC     300
AGCATGCGCA AAGAGCTGGA TTTTTAGTTT CTCTGTTATC AATGGCTTAT     350
GCCAACCCAG AATTATATTT AACATCAAAT GGTAGTAATG CAGATGTTAA     400
ATATGTCATC TACATGATAG AGAAAGACCC AGGAAGACAG AAATATGGTG     450
GGTTTGTCGT CAAGACTAGA GAGATGGTTT ATGAAAAGAC AACTGACTGG     500
ATGTTTGGGA GTGATCTTGA GTATGATCAA GACAATATGT TGCAAAATGG     550
TAGAAGCACT TCTACAATCG AGGATCTTGT TCATACTTTT GGATATCCAT     600
CGTGTCTTGG AGCCCTTATA ATCCAGGTTT GGATAATACT TGTTAAGGCT     650
ATAACCAGTA TATCAGGATT GAGGAAAGGA TTCTTTACTC GGTTAGAAGC     700
ATTTCGACAA GATGGAACAG TTAAATCCAG TCTAGTGTTG AGCGGTGATG     750
CAGTAGAACA AATTGGATCA ATTATGAGGT CCCAACAGAG CTTGGTAACA     800
CTCATGGTTG AAACACTGAT AACAATGAAC ACAGGCAGGA ATGACCTGAC     850
AACAATAGAA AAGAATATAC AGATTGTAGG AAACTACATC AGAGATGCAG     900
GTCTTGCTTC ATTTTTCAAC ACAATCAGAT ATGGCATTGA GACTAGAATG     950
GCAGCTCTAA CTCTGTCTAC CCTTAGACCG GACATCAACA GACTCAAGGC    1000
ACTGATAGAG CTATATCTAT CAAAGGGGCC ACGTGCTCCT TTTATATGCA    1050
TTTTGAGAGA TCCTGTGCAT GGTGAGTTTG CACCAGGCAA CTATCCTGCC    1100
CTCTGGAGTT ATGCGATGGG TGTAGCAGTT GTACAAAACA AGGCCATGCA    1150
ACAGTATGTA ACAGGAAGGT CCTATCTGGA TATTGAAATG TTCCAACTGG    1200
GTCAAGCAGT GGCACGTGAC GCCGAGTCGC AGATGAGTTC AATATTAGAG    1250
GATGAACTGG GGGTCACACA AGAAGCCAAG CAAAGCTTGA AGAAACACAT    1300
GAAGAACATC AGCAGTTCAG ATACAACCTT CTATAAGCCT ACAGGGGGAT    1350
CAGCCATAGA AATGGCAATA GATGAGGAAG CAGAGCAGCC CGAATCCAGA    1400
GGAGACCAAG ACCAAGGAGA TGAACCTCGG TCATCCATAG TTCCTTATGC    1450
ATGGGCAGAC GAAACCGGGA ATGACAACCA AACTGAATCA ACCACAGAAA    1500
TTGACAGCAT CAAAACTGAA CAAAGAAACA TCAGAGACAG GCTGAACAAA    1550
AGACTCAACG AGAAAAGGAA ACAGAGTAAC CCGGGATCAA CTGACATCAC    1600
AAACAACACA AATCAAACTG AAATAGATGA TTTATTCAGT GCATTCGGAA    1650
GCAACTAGTC ACAAAGAGAT GACCACCATC ATCAGCAACA AGTAAGAAAA    1700
ACTTAGGATT AATGGAAATT ATCCAATCCG GAGACGGAAG GACAAATCCA    1750
GAATCCAACC ACAACTCAAT CAACCAAAGA TTCATGGAAG ACAATGTTCA    1800
AAACAATCAA ATCATGGATT CTTGGGAAGA GGGATCAGGA GATAAATCAT    1850
CTGACATCTC ATCGGCCCTC GACATCATTG AATTCATACT CAACACCGAC    1900
TCCCAAGAGA ACACGGCAGA CAGCAATGAA ATCAACACAG GAGCCACAAG    1950
ACTTAGCACG ACAATCTACC AACTTGAGTC CAAAACAACA GAAACAAGCA    2000
AGGAAAATAG TGGACCAGCT AACAAAAATC GACAGTTTGG GGCATCACAC    2050
GAACGTGCCA CAGAGACAAA AGATAGAAAT GTTAATCAGA AGACTGTACA    2100
GGGAGGATAT AGGAGAGGAA GCAGCCCAGA TAGTAGAACT GAGACTATGG    2150
TCACTCGAGG AATCTCCAGA AGCAGCCCAG ATCCTAACAA TGGAACCCAA    2200
ATCCAGGAAG ATATTGATTA CAATGAAGTT GGAGAGATGG ATAAGGACTC    2250
TACTAAGAGG GAAATGCGAC AATTTAAAGA TGTTCCAGTC AAGGTATCAG    2300
GAAGTGATGC CATTCCTCCA ACAAAACAAG ATGGAGACGG TGATGATGGA    2350
```

Figure 2A

SEQ ID NO: 36

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AGAGGCCTGG AATCTATCAG TACATCTGAT TCAGGATATA CCAGTATAGT
GACTGCCGCA ACACTAGATG ACGAAGAAGA ACTCCTTATG AAGAACAACA
GGCCAAGAAA GTATCAATCA ACACCCCAGA ACAGTGACAA GGGAATTAAA
AAAGGGAGTG GAAGGCCAAA AGACACAGAC AAACAATCAC CAATATTGGA
CTACGAACTC AACTCCAAAG GATCGAAGAA GAGCCAGAAA ATCCTCAAAG
CCAGCACGAA TACAGGAGAA CCAACAAGAT CACAGAGTGG ATCCCAGGGG
AAGAGAATCA CATCCTGGAA CATCCTCAAC AGCGAGAGCG GCAATCGAGC
AGAATCAACA AACCAAACCC ATCAGACATC AATCTCGGGA CAGAACCACA
CAATGGGACC AAGCAGAACA ACCTCAGAAC CAAGGACCAA GACACAAAAG
ACGGATGGAA AGGAAAGAGA GGACACAGAA GAGAGCACTC GATTTACAGA
AAGGGCGATT ACATTATTAC AGAATCTTGG TGTAATCCAA TCTGCAGCAA
AATTAGACCT ATACCAAGAC AAGAGAGTTG TGTGTGTGGC GAATGTCCTA
AACAATGCAG ATACTGCATC AAAGATAGAC TTCCTAGCAG GTTTGATGAT
AGGAGTGTCA ATGGATCATG ATGTCAAATT AAATCAGATT CAGAACGAGA
TATTAAGTTT AAAAACTGAT CTTAAGAAGA TGGATGAATC ACATAGAAGA
CTAATTGAGA ATCAAAAAGA ACAATTATCA CTGATCACAT CATTAATCTC
AAATCTTAAA ATCATGACAG AGAGAGGAGG GAAGAAGGAC CAACCAGAAC
CTAGCGGGAG GACATCCATG ATCAAGACAA AGGCAAAAGA AGAGAGAATA
AAGAAAGTCA GGTTTGACCC TCTTATGGAA ACACAGGGCA TCGAGAAAAA
CATCCCTGAC CTCTACAGAT CAATAGAGAA AACACCAGAA AACGACACAC
AGATCAAATC AGAAATAAAC AGATTGAATG ATGAATCCAA TGCCACTAGA
TTAGTACCTA GAAGAATAAG CAGTACAATG AGATCACTAA TAATAATCAT
CAACAACAGC AATTTATCAT CAAAAGCAAA GCAATCATAC ATCAACGAAC
TCAAGCTCTG CAAGAGTGAT GAGGAAGTGT CTGAGTTGAT GGACATGTTC
AATGAGGATG TCAGCTCCCA GTAAACCGCC AACCAAGGGT CAACACCAAG
AAAACCAACA GCACAAAACA GCCAATAAGA GACCATCCCA ACACACCGAA
CCAATCAACA CATAACAAAG ATCTTTAGAT CATAGATGAC TAAGAAAAAC
TTAGGATGAA AGGACTGATC AATCCTCCAA AACAATGAGC ATCACCAGCT
CCACAATCTA CACATTCCCA GAATCCTCTT TCTCCGAGAA TGGCAACATA
GAGCCGTTAC CACTCAAGGT CAATGAACAG AGAAAGGCCA TACCTCATAT
TAGGGTTGTC AAGATAGGAG ATCCGCCCAA ACATGGATCC AGATATCTGG
ATGTCTTTTT ACTGGGCTTC TTTGAAATGG AAAGGTCAAA AGACAGGTAT
GGGAGCATAA GTGATCTAGA TGATGATCCA AGTTACAAGG TTTGTGGCTC
TGGATCATTG CCACTTGGGT TGGCTAGATA CACTGGAAAT GATCAGGAAC
TCCTACAGGC TGCAACCAAG CTCGATATAG AAGTAAGAAG AACTGTAAAG
GCTACGGAGA TGATAGTTTA CACTGTGCAA AACATCAAAC CTGAACTATA
TCCATGGTCC AGTAGATTAA GAAAAGGGAT GTTATTTGAC GCTAACAAGG
TTGCACTTGC TCCTCAATGT CTTCCACTAG ATAGAGGGAT AAAATTCAGG
GTGATATTTG TGAACTGCAC AGCAATTGGA TCAATAACTC TATTCAAAAT
CCCCAAGTCC ATGGCATTGT TATCATTGCC TAATACAATA TCAATAAATC
TACAAGTACA TATCAAAACA GGAATTCAGA CAGATTCCAA AGGAGTAGTT
CAGATTCTAG ATGAAAAAGG TGAAAAATCA CTAAATTTCA TGGTTCATCT
CGGGTTGATC AAAAGGAAGA TGGGTAGAAT GTACTCAGTT GAATATTGTA
AGCAGAAGAT TGAGAAGATG AGATTATTAT TCTCATTGGG ATTAGTTGGA
GGGATCAGCT TCCACGTCAA CGCAACTGGC TCTATATCAA AGACATTAGC
AAGTCAATTA GCATTTAAAA GAGAAATCTG CTATCCCCTA ATGGATCTGA
ATCCACACTT AAATTTAGTT ATATGGGCAT CATCAGTTGA AATTACAAGA
```

Figure 2B

SEQ ID NO: 36

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GTAGATGCAA TTCTCCAGCC TTCATTAGCT GGCGAATTCA GATACTAGCC      4781
AAACATCATA GCAAAAGGGG TCGGGAAAAT CAGACAGTAA AACCAACAAC      4800
CCTGACATCC AACACTGCAA ATCAGGCTAC CCACAGGAGA AAAATCAAAA      4850
ACTTAGGATC AAAGGGATCA CCACAAACCC CGGGAAACAG CCAAACCAAC      4900
CAACACACAA ATCACAGACA AAAAGGAAAA GGCACTGCAA AGACCGAGAA      4950
CAAGCAGAAC GCACACAACC AAGCAGAGGA AAGCCAAAGC CCGCCATTCA      5000
CAAACACACC AACAATCCTA CAAACAAGCA CCAAAATAGA GGTCAAAAGA      5050
CAAAGAGCAT CAGATATGAC CATCACAACC ATAATCATAG CCATACTACT      5100
AATACCCCTA TCATTCTGTC AAATAGACAT AACAAAACTG CAACGTGTAG      5150
GTGTATTAGT CAACAATCCC AAAGGCATGA AAATTTCACA AAATTTTGAA      5200
ACGAGATACC TGATATTAAG TCTGATACCC AAAATAGAGA ATTCACACTC      5250
ATGTGGGGAT CAACAGATAA ACCAATACAA GAAGTTATTG GATAGATTGA      5300
TAATTCCTCT ATATGATGGA TTAAAATTAC AAAAAGATGT AATAGTAGTA      5350
AGTCATGAAA CCCATAATAA TACTAATCTT AGGACAAAAC GATTCTTTGG      5400
AGAGATAATT GGGACAATTG CGATAGGGAT AGCCACCTCA GCGCAAATCA      5450
CCGCAGCAGT CGCTCTTGTC GAAGCTAAAC AGGCAAGGTC AGACATAGAA      5500
AAACTCAAAG AAGCTATAAG AGACACAAAC AAGGCAGTAC AATCGATTCA      5550
AAGTTCTGTA GGTAACCTAA TTGTTGCAGT TAAATCAGTT CAAGACTATG      5600
TCAACAATGA AATTGTACCT TCAATCACAA GATTAGGCTG TGAAGCAGCA      5650
GGGTTACAAT TGGGAATTGC ACTGACACAA CATTACTCAG AATTAACAAA      5700
TATATTTGGT GATAATATAG GAACACTGAA AGAAAAAGGG ATAAAATTAC      5750
AGGGGATAGC ATCGTTATAT CATACAAACA TAACAGAAAT ATTTACTACT      5800
TCAACAGTTG ACCAATATGA TATTTATGAC CTATTATTCA CTGAATCAAT      5850
CAAGATGAGA GTGATAGATG TTGATTTGAG TGATTACTCA ATTACTCTTC      5900
AAGTTAGACT TCCTTTATTA ACTAAACTAT CAAATACTCA GATTTATAAA      5950
GTAGATTCTA TATCATACAA CATCCAGGGC AAAGAGTGGT ATATTCCTCT      6000
TCCCAATCAC ATCATGACAA AAGGGGCTTT TCTAGGTGGT GCTGATATTA      6050
AAGAATGCAT AGAGGCATTC AGCAGTTATA TATGTCCTTC TGATCCAGGT      6100
TATATATTAA ATCACGAGAT AGAGAATTGT TTATCAGGGA ACATAACACA      6150
GTGTCCTAAG ACTGTTGTTA CATCAGATGT GGTACCACGA TACGCGTTTG      6200
TGAATGGTGG ATTAATTGCA AACTGCATAA CAACTACATG TACATGCAAT      6250
GGAATTGACA ATAGAATTAA TCAATCACCT GATCAAGGAA TTAAGATCAT      6300
AACACATAAA GAATGCCAGG TAATAGGTAT AAACGGAATG TTATTCAATA      6350
CTAATAGAGA AGGGACATTA GCAACTTATA CATTTGATGA CATTATATTA      6400
AATAACTCTG TTGCACTTAA TCCAATTGAT ATATCTATGG AACTTAACAA      6450
GGCAAAACTA GAATTAGAAG AATCGAAGGA ATGGATAAAG AAATCAAATC      6500
AAAAGTTAGA TTCCGTTGGA AGTTGGTATC AATCTAGTGC AACAATCACC      6550
ATAATCATAG TGATGATAAT AATTCTATTT ATAATCAATA TAACAATTAT      6600
TGTAGTCATA ATCAAATTCT ATAGAATTAA GGGGGAAAAT CAAAACGACA      6650
AAAACAGTGA GCCGTATATA CTGACAAATA GACAATAAGA CTATACACGA      6700
TCAAATATAG AAAGTACAAA AAACTTAGGA ACAAAGTTGT TCAACACAGC      6750
AGCAGCGAAC AGACCCAAAG GCAGCGCAGA GGCGACACCG AACCCAAAAA      6800
TGGAATATTG GAAACACACA AACAGCACAA AAAACACCAA CAATGAAACC      6850
GAAACAACCA GAGGCAAACA CAGTAGCAAG GTTACAAATA TCATAATGTA      6900
CACCTTCTGG ACAATAACAT CAACAATATT ATTAGTCATT TTTATAATGA      6950
TATTGACAAA CTTAATTCAA GAGAACAATC ATAATAAATT AATGTTGCAG      7000
GAAATAAGAA AAGAATTCGC GGCAATAGAC ACCAAGATTC AGAGGACCTC      7050
```

Figure 2C

SEQ ID NO: 36

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GGATGACATT GGAACCTCAA TACAGTCAGG AATAAATACA AGACTTCTCA
CAATTCAGAG TCATGTTCAA AACTATATCC CACTATCACT AACACAACAA
ATGTCAGATC TCAGAAAATT TATCAATGAT CTAACAAATA AAAGAGAACA
TCAAGAAGTG CCAATACAGA GAATGACTCA TGATAGAGGT ATAGAACCCC
TAAATCCAGA CAAGTTCTGG AGGTGTACAT CTGGTAACCC ATCTCTAACA
AGTAGTCCTA AGATAAGGTT AATACCAGGG CCAGGTTTAT TAGCAACATC
TACTACAGTA AATGGCTGTA TTAGAATCCC ATCGTTAGCA ATCAATCATT
TAATCTACGC TTACACCTCT AATCTTATCA CCCAGGGCTG TCAAAATATA
GGGAAATCTT ACCAAGTACT ACAAATAGGG ATAATTACTA TAAATTCGGA
CCTAGTACCT GATTTAAATC CCAGAGTCAC ACATACATTT AATATTGATG
ATAATAGGAA ATCTTGCTCT CTGGCACTAT TGAATACAGA TGTTTATCAG
TTATGCTCAA CACCAAAAGT TGATGAGAGA TCCGATTATG CATCAACAGG
TATTGAGGAT ATTGTACTTG ACATTGTCAC TAATAATGGA TTAATTATAA
CAACAAGGTT TACAAATAAT AATATAACTT TTGATAAACC GTATGCAGCA
TTGTATCCAT CAGTAGGACC AGGAATCTAT TATAAGGGTA AAGTTATATT
TCTCGGATAT GGAGGTCTAG AGCATGAAGA AAACGGAGAC GTAATATGTA
ATACAACTGG TTGTCCTGGC AAAACACAGA GAGACTGTAA TCAGGCTTCT
TATAGCCCAT GGTTCTCAAA TAGGAGAATG GTAAACTCTA TTATTGTTGT
TGATAAAGGC ATAGATGCAA CTTTTAGCTT GAGGGTGTGG ACTATTCCAA
TGAGCCAAAA TTATTGGGGA TCAGAAGGAA GATTACTTTT ATTAGGTGAC
AGAATATACA TATATACTAG ATCCACAAGT TGGCACAGTA AATTACAGTT
AGGGGTAATT GATATTTCTG ATTATAATAA TATAAGAATA AATTGGACTT
GGCATAATGT ACTATCACGG CCAGGAAATG ATGAATGTCC ATGGGGTCAT
TCATGCCCAG ACGGATGTAT AACAGGAGTT TACACTGATG CATATCCGCT
AAACCCATCG GGGAGTGTTG TATCATCAGT AATTCTTGAC TCACAAAAGT
CTAGAGAAAA CCCAATCATT ACCTACTCAA CAGCTACAAA TAGAATAAAT
GAATTAGCTA TATATAACAG AACACTTCCA GCTGCATATA CAACAACAAA
TTGTATCACA CATTATGATA AAGGGTATTG TTTTCATATA GTAGAAATAA
ATCACAGAAG TTTGAATACG TTTCAACCTA TGTTATTCAA AACAGAAGTT
CCAAAAAACT GCAGCTAAAT TGATCATCGC ATATCGGATG CCAGATGACA
TTAAAAGAGA CCACCAGACA GACAACACAG GAGATGATGC AAGATATAAA
GGAATAATAA AAAACTTAGG AGAAAAGTGT GCAAGAAAAA TGGACACTGA
ATCCCACAGC GGCACAACAT CTGACATTCT GTACCCTGAA TGTCACCTCA
ATTCTCCTAT AGTTAAAGGA AAAATAGCAC AACTGCATAC AATAATGAGT
TTGCCCCAAC CCTACGATAT GGATGATGAT TCAATACTGA TTATTACTAG
ACAAAAAATC AAACTCAATA AATTAGATAA AAGACAACGG TCAATTAGGA
AATTAAGATC AGTCTTAATG GAAAGAGTAA ATGATCTTGG TAAATACACC
TTTATCAGAT ATCCAGAAAT GTCTAGTGAA ATGTTCCAAT TATGTATACC
CGGAATTAAT AATAAAATAA ATGAATTGCT AAGTAAAGCA AGTAAAACAT
ATAATCAAAT GACTGATGGA TTAAGAGATC TATGGGTTAC TGTACTATCG
AAGTTAGCAT CGAAAAATGA TGGAAGTAAT TATGATATCA ATGAAGATAT
TAGCAATATA TCAAATGTTC ACATGACTTA CCAATCAGAC AAATGGTATA
ATCCATTCAA GACATGGTTT ACTATTAAGT ATGACATGAG GAGATTACAA
AAAGCCAAAA ATGAGATTAC ATTCAATAGG CATAAAGATT ATAATCTATT
AGAAGACCAA AAGAATATAT TGCTGATACA TCCAGAACTC GTCTTAATAT
TAGATAAACA AAATTACAAT GGGTATATAA TGACTCCTGA ATTGGTACTA
ATGTATTGTG ATGTAGTTGA AGGGAGGTGG AATATAAGTT CATGTGCAAA
```

Figure 2D

SEQ ID NO: 36

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ATTGGATCCT AAATTACAAT CAATGTATTA TAAAGGTAAC AATTTATGGG      9450
AAATAATAGA TGGACTATTC CTGACCTTAG GAGAAAGAAC ATTTGACATA      9500
ATATCACTAT TAGAACCGCT TGCATTATCG CTCATTCAAA CTCATGACCC      9550
GGTTAAACAG CTCAGAGGGG CTTTTTTAAA TCACGTGTTA TCAGAAATGG      9600
AATCAATATT CGCAGCTGAG TGTACAACAG AGGAAATACC TAATGTGGAT      9650
TATATAGATA AAATTTTAGA TGTATTCAAA GAATCAACAA TAGATGAAAT      9700
AGCAGAAATT TTCTCTTTCT TCCGAACTTT TGGACACCCT CCATTAGAGG      9750
CGAGTATAGC AGCAGAGAAA GTTAGAAAGT ATATGTACAC TGAGAAATGT      9800
TTGAAATTTG ATACTATCAA TAAATGTCAT GCTATTTTTT GTACAATAAT      9850
TATAAATGGA TATAGAGAAA GACATGGTGG TCAATGGCCT CCAGTTACAT      9900
TACCTATTCA TGCACATGAA TTTATCATAA ATGCGTACGG ATCAAATTCT      9950
GCCATATCAT ATGAAAATGC TGTAGATTAT TATAAGAGCT TCATAGGAAT     10000
AAAATTTGAC AAGTTTATAG AGCCTCAATT GGATGAAGAC TTAACTATTT     10050
ATATGAAAGA TAAAGCATTA TCCCCAAAGA AATCTAACTG GGACACAGTC     10100
TATCCAGCTT CAAACCTGTT ATACCGCACT AATGTGTCTC ATGATTCACG     10150
AAGATTGGTT GAAGTATTTA TAGCAGATAG TAAATTTGAT CCCCACCAAG     10200
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ATCTCATATA GTTTAAAAGA GAAAGAAATA AAACAAGAAG GTAGACTTTT     10300
TGCAAAAATG ACATACAAGA TGAGAGCTAC ACAAGTATTA TCAGAAACAT     10350
TATTGGCGAA TAATATAGGG AAATTCTTCC AAGAGAATGG GATGGTTAAA     10400
GGAGAAATTG AATTACTCAA GAGACTGACA ACAATATCTA TGTCTGGGGT     10450
TCCGCGGTAT AATGAGGTAT ACAATAATTC AAAAAGTCAC ACAGAGGAAC     10500
TTCAAGCTTA TAATGCAATT AGCAGTTCCA ATTTATCTTC TAATCAGAAG     10550
TCAAAGAAGT TTGAATTTAA ATCAACAGAT ATATACAATG ATGGATACGA     10600
AACCGTAAGC TGCTTCTTAA CGACAGATCT TAAAAAATAT TGTTTAAATT     10650
GGAGGTATGA ATCAACAGCT TTATTCGGTG ATACTTGTAA TCAGATATTT     10700
GGGTTAAAGG AATTATTTAA TTGGCTGCAC CCTCGCCTTG AAAAGAGTAC     10750
AATATATGTT GGAGATCCTT ATTGCCCGCC ATCAGATATT GAACATTTAC     10800
CACTTGATGA CCATCCTGAT TCAGGATTTT ATGTTCATAA TCCTAAAGGA     10850
GGAATAGAAG GGTTTTGCCA AAAGTTATGG ACACTCATAT CTATCAGTGC     10900
CATACATTTA GCAGCTGTCA AAATCGGTGT AAGAGTTACT GCAATGGTTC     10950
AAGGGGATAA TCAAGCCATA GCTGTTACCA CCAGAGTACC TAATAATTAT     11000
GATTATAAGG TTAAGAAAGA GATTGTTTAT AAAGATGTGG TAAGATTTTT     11050
TGATTCTTTG AGAGAGGTTA TGGATGATCT GGGTCATGAG CTCAAACTAA     11100
ATGAAACTAT AATAAGTAGT AAAATGTTTA TATATAGCAA AAGGATATAC     11150
TATGACGGAA GAATCCTTCC TCAGGCGTTA AAAGCATTGT CTAGATGTGT     11200
TTTTTGGTCT GAAACAATCA TAGATGAGAC AAGATCAGCA TCCTCAAATC     11250
TGGCGACATC GTTTGCAAAG GCCATTGAGA ATGGCTACTC ACCTGTATTG     11300
GGATATGTAT GCTCAATCTT CAAAAATATC CAACAGTTGT ATATAGCACT     11350
TGGAATGAAT ATAAATCCAA CTATAACCCA AAATATTAAA GATCAATATT     11400
TCAGGAATAT TCATTGGATG CAATATGCAT CTCTAATCCC TGCTAGTGTC     11450
GGAGGATTTA ATTATATGGC CATGTCAAGG TGTTTTGTCA GAAACATTGG     11500
AGATCCTACA GTCGCTGCAT TAGCTGATAT TAAAAGATTT ATAAAAGCAA     11550
ATTTGTTAGA TCGAGGTGTC CTTTACAGAA TTATGAATCA GGAACCAGGC     11600
GAGTCCTCCT TTTTAGACTG GGCTTCAGAC CCCTATTCAT GTAACTTACC     11650
ACAATCTCAA AATATAACCA CCATGATAAA GAATATAACT GCAAGAAATG     11700
TACTACAGGA CTCACCAAAC CCATTACTAT CTGGATTATT TACAAGTACA     11750
```

Figure 2E

SEQ ID NO: 36

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ATGATAGAAG AGGATGAGGA ATTAGCTGAG TTGCTAATGG ACAGGAGAAT    11800
AATTCTCCCA AGGGTTGCGC ATGACATTTT AGATAATTCT CTTACTGGAA    11850
TTAGGAATGC TATAGCTGGT ATGTTGGATA CAACAAAATC ACTAATTCGA    11900
GTAGGGATAA ACAGAGGAGG ATTAACCTAT AACTTATTAA GAAAGATAAG    11950
CAACTATGAT CTTGTACAAT ATGAGACACT TAGTAAAACT TTAAGACTAA    12000
TAGTCAGTGA CAAGATTAAG TATGAAGATA TGTGCTCAGT AGACCTAGCC    12050
ATATCATTAA GACAAAAAAT GTGGATGCAT TTATCAGGAG GAAGAATGAT    12100
AAATGGACTT GAAACTCCAG ATCCTTTAGA GTTACTGTCT GGAGTAATAA    12150
TAACAGGATC TGAGCATTGT AGGATATGTT ATTCAACTGA AGGTGAAAGC    12200
CCATATACAT GGATGTATTT ACCAGGCAAT CTTAATATAG GATCAGCTGA    12250
AACAGGAATA GCATCATTAA GGGTCCCTTA CTTTGGATCA GTTACGGATG    12300
AGAGATCTGA AGCACAATTG GGGTATATCA AAAATCTAAG CAAACCAGCT    12350
AAGGCTGCTA TAAGAATAGC AATGATATAT ACTTGGGCAT TTGGGAATGA    12400
CGAAATATCT TGGATGGAAG CATCACAGAT TGCACAAACA CGTGCGAACT    12450
TTACATTAGA TAGCTTAAAG ATTTTGACAC CAGTGACAAC ATCAACAAAT    12500
CTATCACATA GGTTAAAAGA TACTGCTACT CAGATGAAAT TTTCTAGTAC    12550
ATCACTTATT AGAGTAAGCA GGTTCATCAC AATATCTAAT GATAATATGT    12600
CTATTAAAGA GGCAAATGAA ACTAAAGATA CAAATCTTAT TTATCAACAG    12650
GTAATGTTAA CAGGGTTAAG TGTATTTGAA TATCTATTTA GGTTAGAGGA    12700
GAGTACAGGA CATAACCCTA TGGTCATGCA TCTACATATA GAGGATGGAT    12750
GTTGTATCAA AGAGAGTTAC AATGATGAGC ATATCAATCC GGAGTCTACA    12800
TTAGAGTTAA TTAAATACCC TGAGAGTAAT GAATTTATAT ATGATAAGGA    12850
CCCTTTAAAG GATATAGATC TATCAAAATT AATGGTTATA AGAGATCATT    12900
CTTATACAAT TGACATGAAT TACTGGGACG ACACAGATAT TGTACATGCA    12950
ATATCAATAT GTACTGCAGT TACAATAGCA GATACAATGT CGCAGCTAGA    13000
TCGGGATAAT CTTAAGGAGC TGGTTGTAAT TGCAAATGAT GATGATATTA    13050
ACAGTCTGAT AACTGAATTT CTGACCCTAG ATATACTAGT GTTTCTCAAA    13100
ACATTTGGAG GGTTACTCGT GAATCAATTT GCATATACCC TTTATGGATT    13150
GAAAATAGAA GGAAGGGATC CCATTTGGGA TTATATAATG AGAACATTAA    13200
AAGACACCTC ACATTCAGTA CTTAAAGTAT TATCTAATGC ACTATCTCAT    13250
CCAAAAGTGT TTAAGAGATT TTGGGATTGT GGAGTTTTGA ATCCTATTTA    13300
TGGTCCTAAT ACTGCTAGTC AGGACCAAGT TAAGCTTGCT CTCTCAATTT    13350
GCGAGTACTC CTTGGATCTA TTTATGAGAG AATGGCTGAA TGGAGCATCA    13400
CTTGAGATCT ATATCTGTGA TAGTGACATG GAAATAGCAA ATGATAGAAG    13450
ACAAGCATTT CTCTCAAGAC ACCTTGCCTT TGTGTGTTGT TTAGCAGAGA    13500
TAGCATCTTT TGGACCAAAT TTATTAAATC TAACATATCT AGAGAGACTT    13550
GACGAATTAA AACAATACTT GGATCTGAAC ATCAAAGAAG ATCCTACTCT    13600
TAAATATGTG CAAGTATCAG GACTGTTAAT TAAATCATTC CCCTCAACTG    13650
TTACGTATGT GAGGAAAACT GCGATTAAGT ATCTGAGGAT TCGTGGCATT    13700
AATCCGCCTG AAACGATTGA AGATTGGGAT CCCATAGAAG ATGAGAATAT    13750
CTTAGACAAT ATTGTTAAAA CTGTAAATGA CAATTGCAGT GATAATCAAA    13800
AGAGAAATAA AAGTAGTTAT TTCTGGGGAT TAGCTCTAAA GAATTATCAA    13850
GTCGTAAAAA TAAGATCCAT AACGAGTGAT TCTGAAGTTA ATGAAGCTTC    13900
GAATGTTACT ACACATGGAA TGACACTTCC TCAGGGAGGA AGTTATCTAT    13950
CACATCAGCT GAGGTTATTT GGAGTAAACA GTACAAGTTG TCTGAAAGCT    14000
CTTGAATTGT CACAAATTTT AATGAGGGAA GTTAAAAAAG ATAAAGATAG    14050
ACTCTTTTTA GGAGAAGGAG CAGGAGCTAT GTTAGCATGT TATGATGCTA    14100
```

Figure 2F

SEQ ID NO: 36

```
CACTCGGTCC TGCAATAAAT TATTACAATT CTGGTTTAAA TATTACAGAT    14101
GTAATTGGTC AACGGGAATT AAAAATCTTC CCATCAGAAG TATCATTAGT    14200
AGGTAAAAAA CTAGGAAATG TAACACAGAT TCTTAATCGG GTGAGGGTGT    14250
TATTTAATGG GAATCCCAAT TCAACATGCA TAGGAAATAT GGAATGTGAG    14300
AGTTTAATAT GGAGTGAATT AAATGATAAG TCAATTGGTT TAGTACATTG    14350
TGACATGGAG GGAGCAATAG GCAAATCAGA AGAAACTGTT TTACATGAAC    14400
ATTATAGTAT TATTAGGATT ACATATTTAA TTGGGGATGA TGATGTTGTT    14450
CTAGTATCAA AAATTATACC AACTATTACT CCGAATTGGT CTAAAATACT    14500
CTATCTATAC AGGTTGTATT GGAAGGATGT GAGTGTAGTG TCCCTTAAAA    14550
CATCCAATCC TGCCTCAACA GAGCTTTATT TAATTTCAAA GGATGCTTAC    14600
TGTACTGTAA TGGAACCCAG TAATCTTGTT TTATCAAAAC TTAAAAGGAT    14650
ATCATCAGTA GAAGAAAATA ATCTATTAAA ATGGATAATC TTATCAAAAA    14700
GGAAGAACAA CGAATGGTTA CAGCATGAAA TCAAAGAAGG AGAAAGGGAT    14750
TATGGGATAA TGAGGCCATA TCATACAGCA CTGCAAATTT TTGGATTCCA    14800
AATTAACTTA AATCACTTAG CTAAAGAATT TTTATCAACT CCTGATTTAA    14850
CCAACATTAA TAATATAATT CAAAGTTTTA CAAGAACAAT TAAAGATGTT    14900
ATGTTCGAAT GGGTCAATAT CACTCATGAC AATAAAAGAC ATAAATTAGG    14950
AGGAAGATAT AATCTATTCC CGCTTAAAAA TAAGGGGAAG TTAAGATTAC    15000
TATCACGAAG ATTAGTACTA AGCTGGATAT CATTATCTTT ATCAACCAGA    15050
TTACTGACAG GCCGTTTCCC AGATGAAAAA TTTGAAAATA GGGCACAGAC    15100
CGGATATGTA TCATTGGCTG ATACTGATTT AGAATCTTTA AAGTTATTAT    15150
CAAGAAATAT TGTCAAAAGT TACAAAGAAC ACATAGGATT AATATCATAC    15200
TGGTTTTTAA CCAAAGAGGT CAAAATACTA ATGAAACTTA TAGGGGGAGT    15250
CAAACTACTA GGAATTCCCA AACAGTACAA AGAGTTAGAG GATCGATCAT    15300
TTCAGGGTTA TGAATATGAT AATGAATTTG ATATTGATTA ATACATAAAA    15350
ACAAAAAATA AAACACCTAA TCCTCTCCCA TTCACTTCCA ACAAAATGAA    15400
AAGTAAGAAA AACATATAAT ATACATATAC CAAACAGAGT TTTTCTCTTG    15450
TTTGGT                                                   15456
```

Figure 2G

Cloning of BPIV3 strain Ka or strain SF N coding region into HPIV3 context

Figure 3A

Mutagenesis to create restriction sites at start and stop codons of N

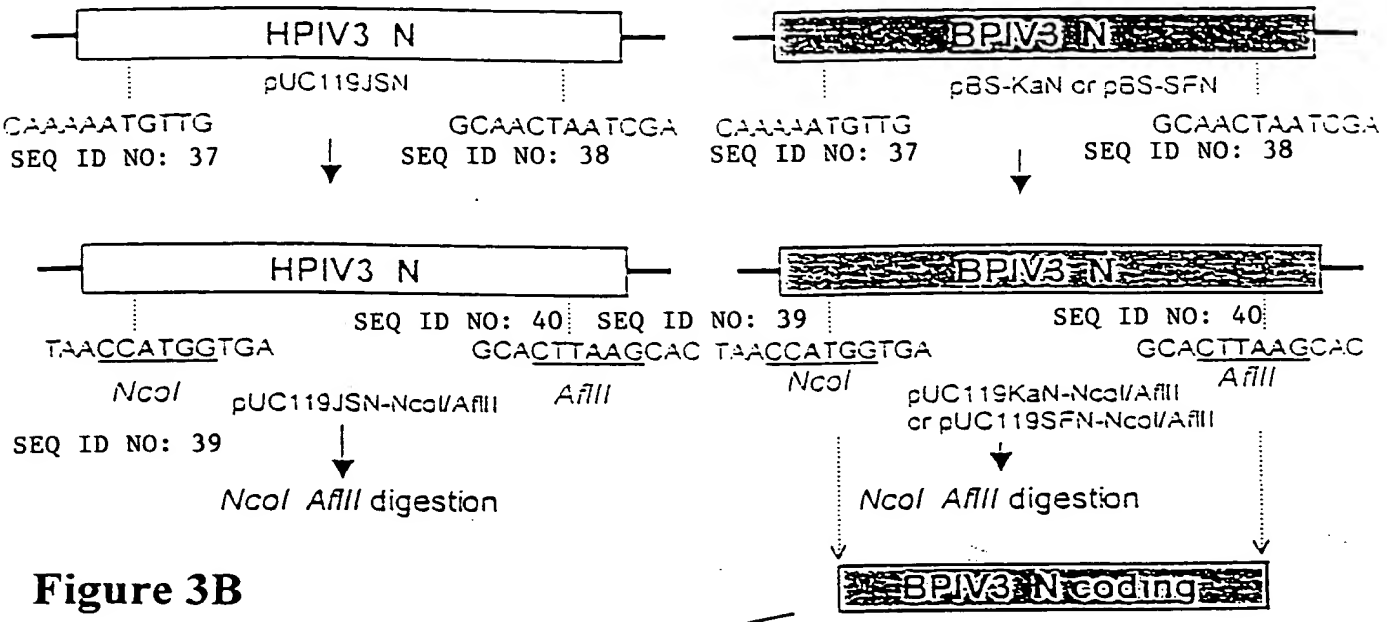


Figure 3B

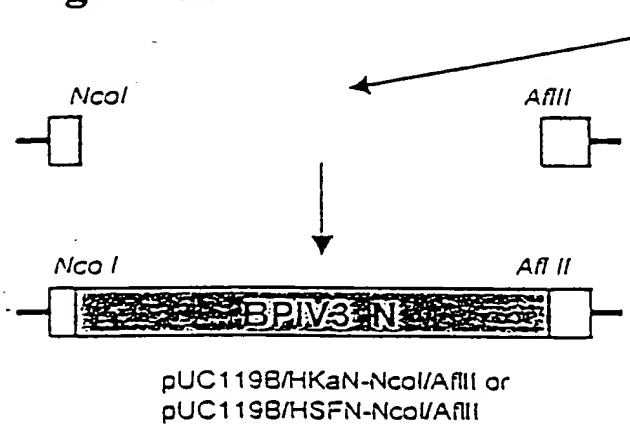
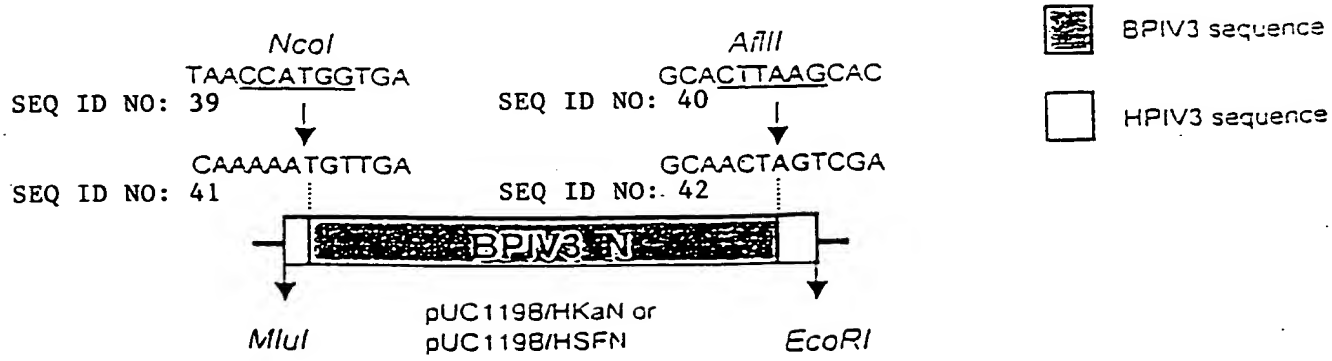


Figure 3C

Mutagenesis to restore start and stop codon context



Cloning of BPIV3 N coding region into HPIV3 antigenomic cDNA

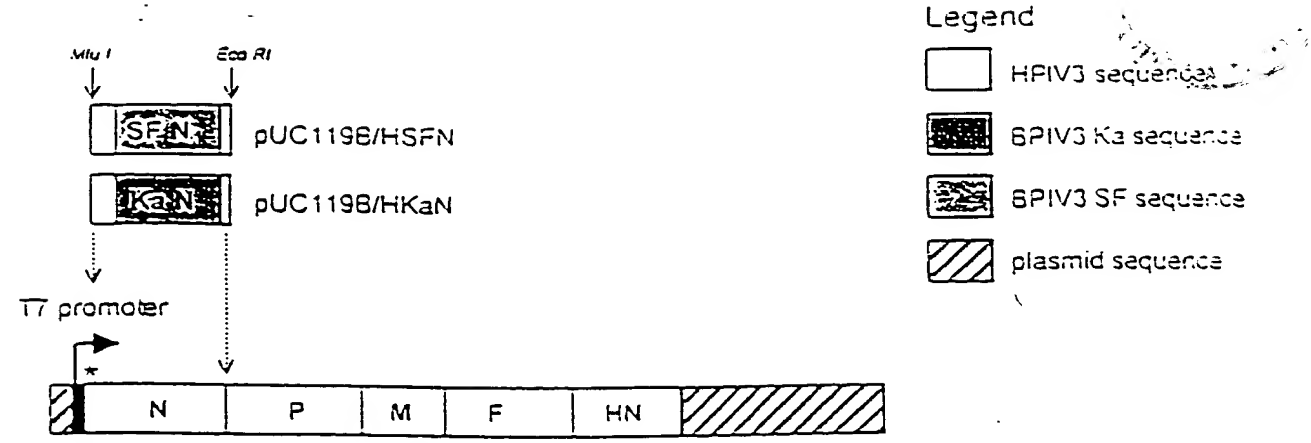


Figure 4A

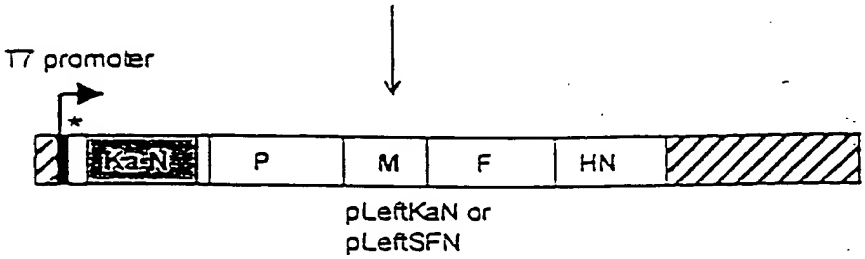
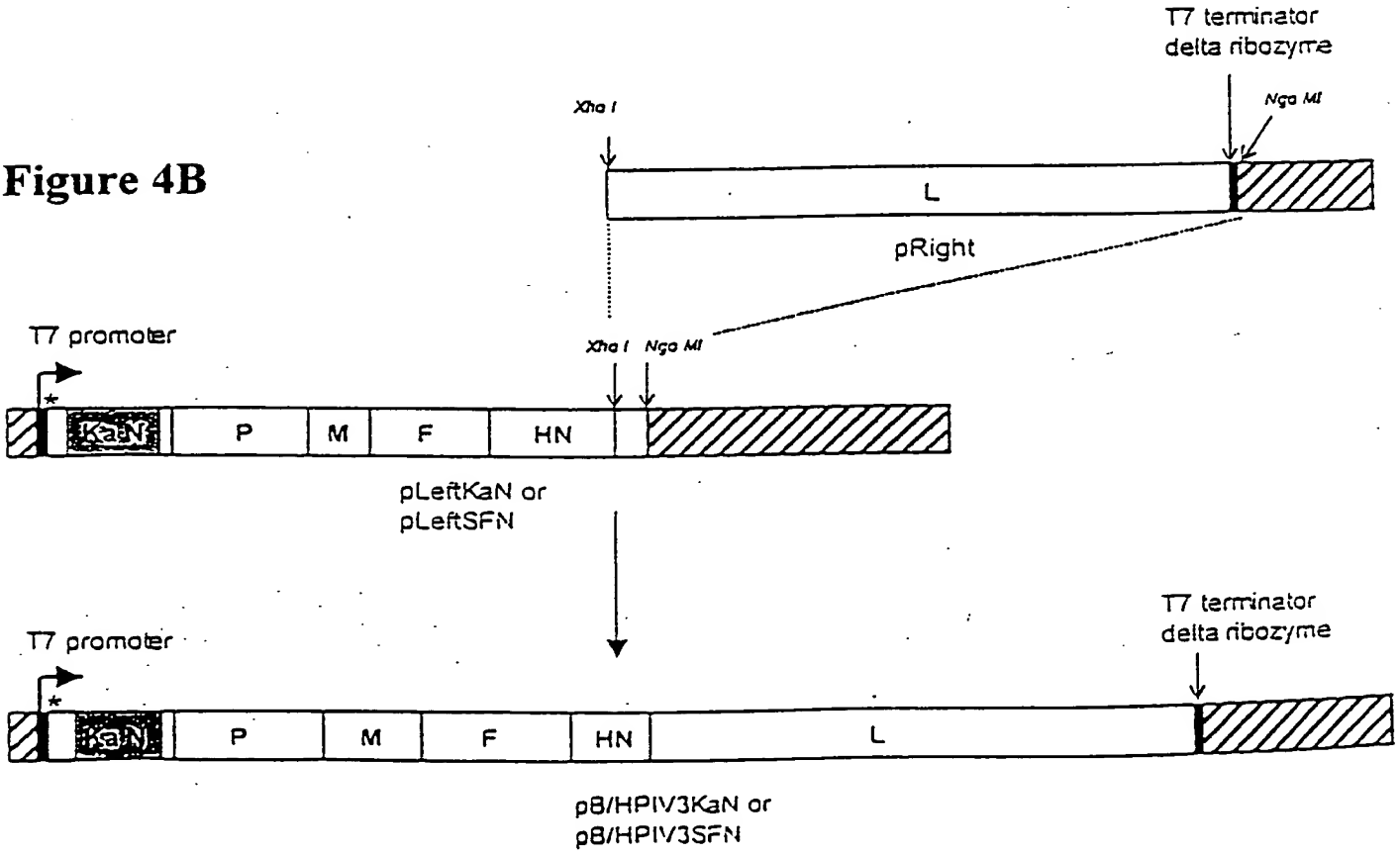


Figure 4B



Nucleotide sequences of HPIV3, BPIV3 and chimeric viruses around the start (A) and stop (B) codons of the N gene

Figure 5A

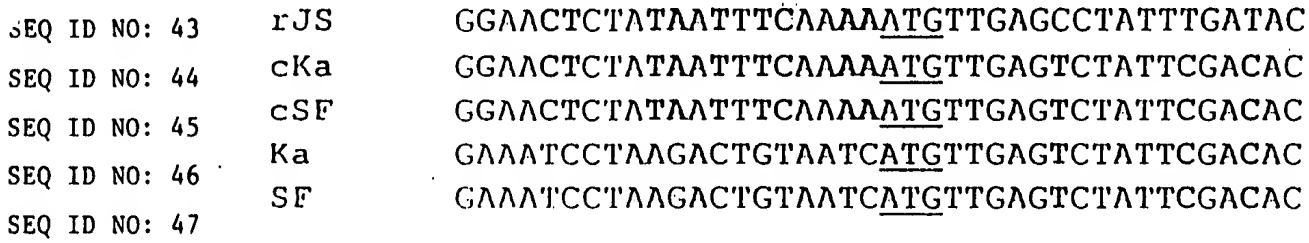


Figure 5B

Confirmation of identity of potential SPIV3:HPIV3 chimeras by TaqI digestion

Figure 6A

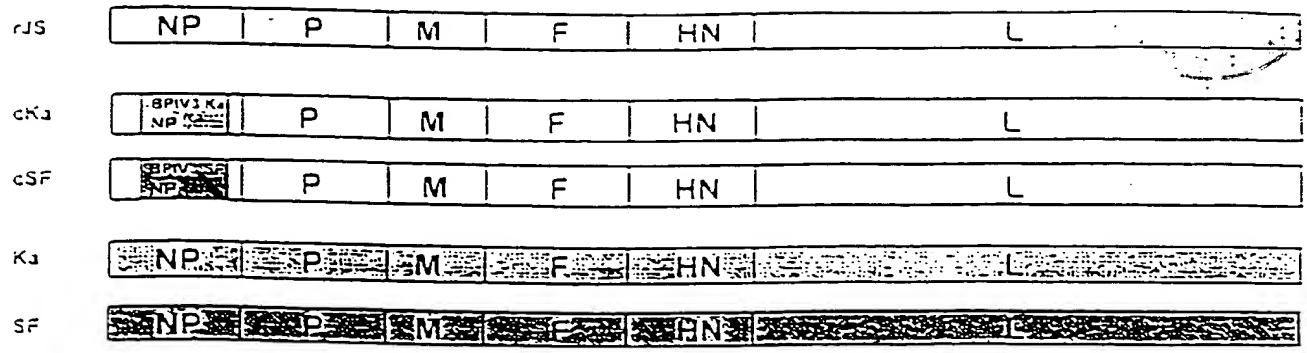


Figure 6B

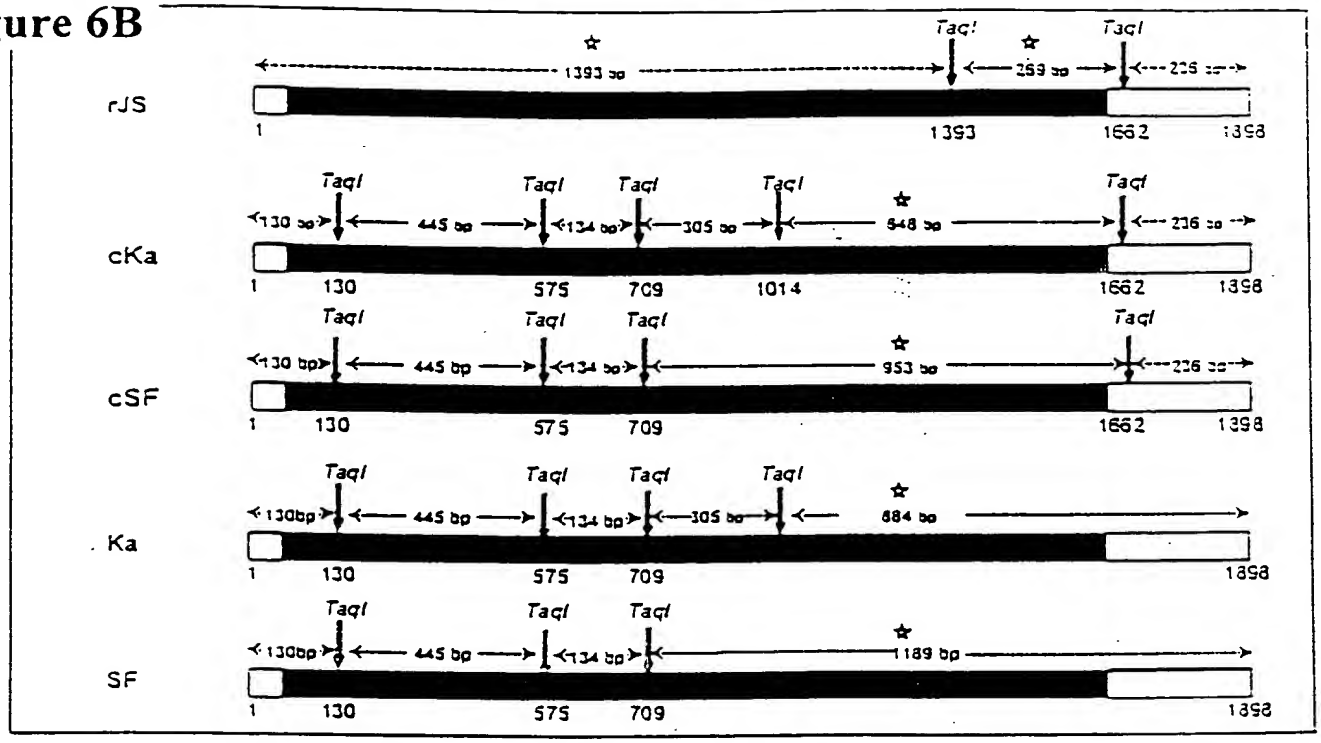


Figure 6C

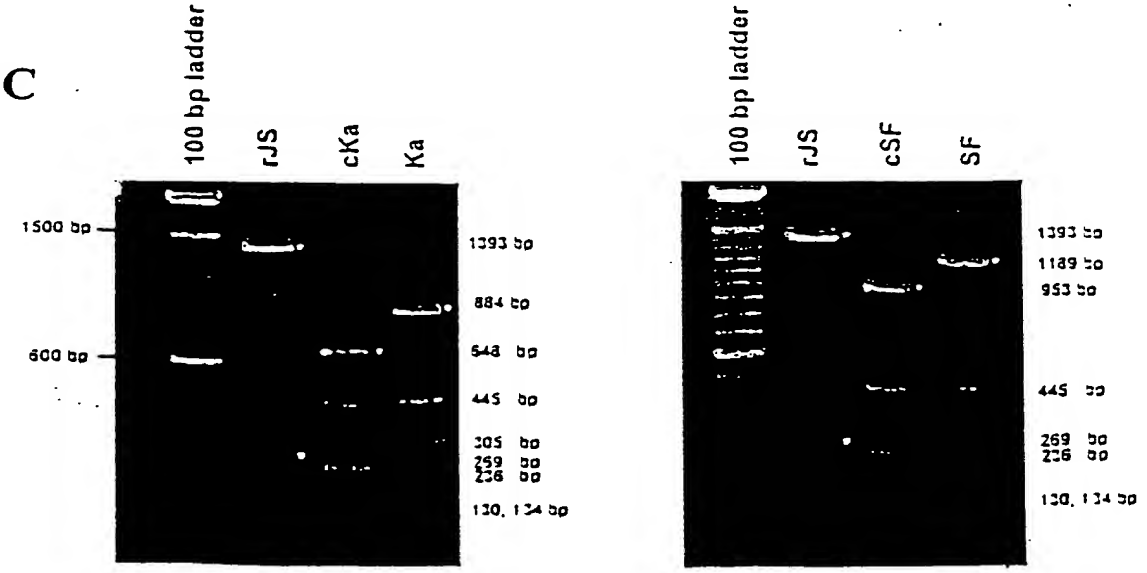


Figure 7A

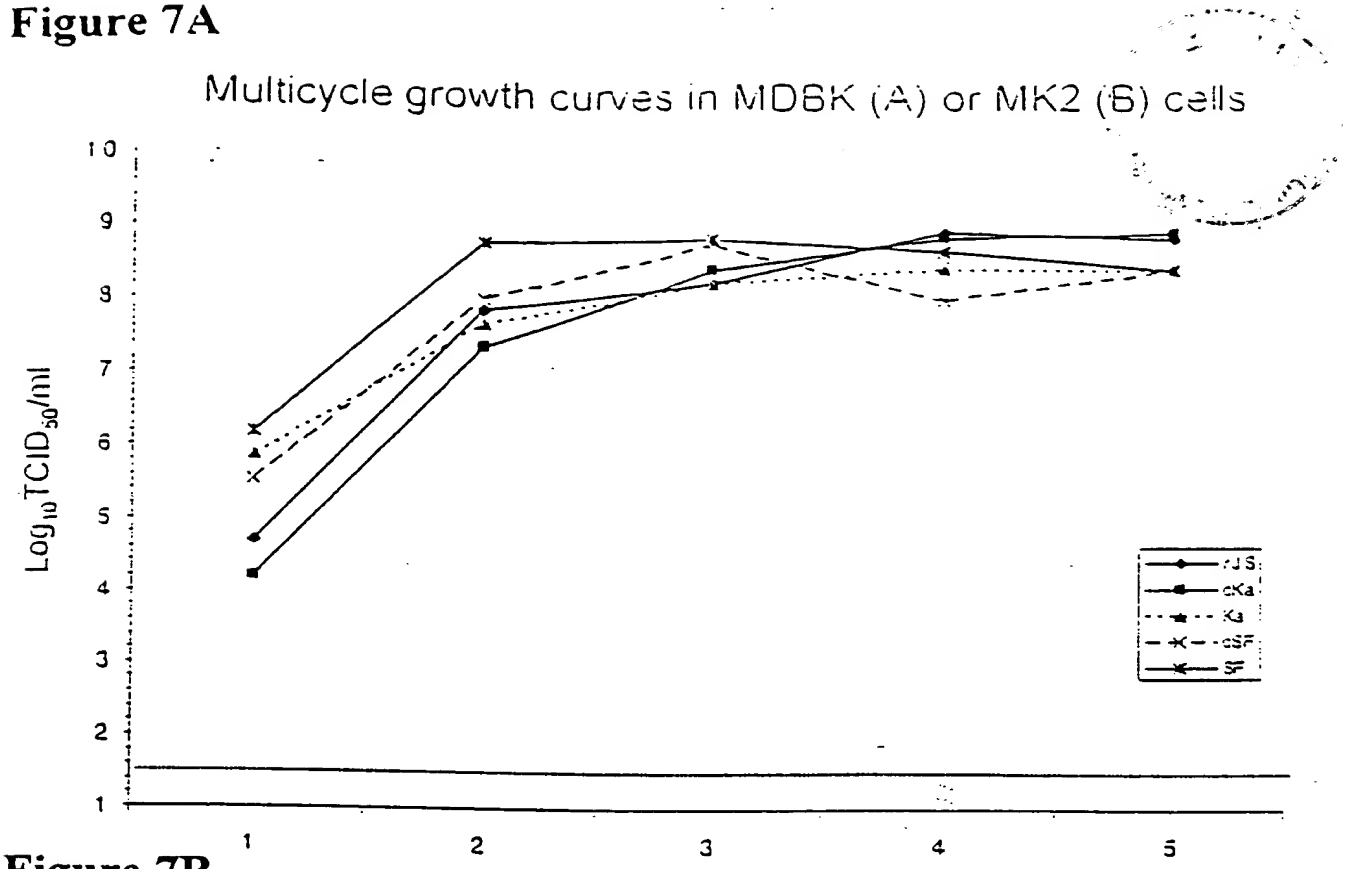


Figure 7B

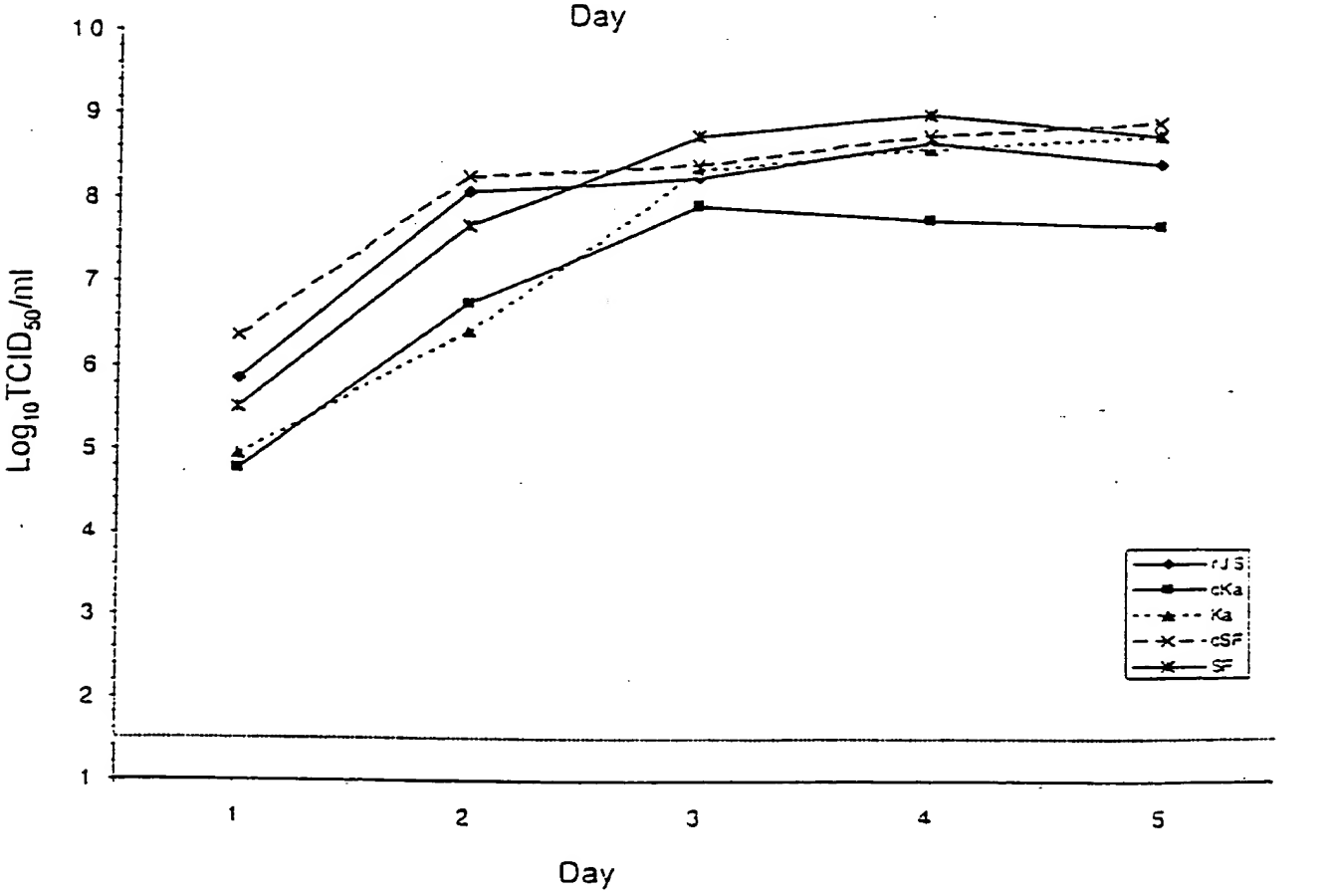


Figure 8A

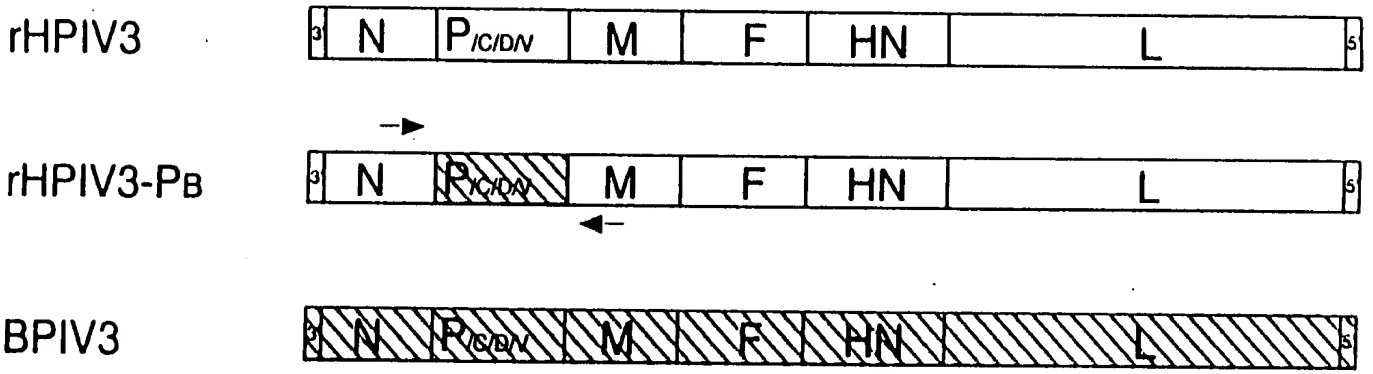


Figure 8B

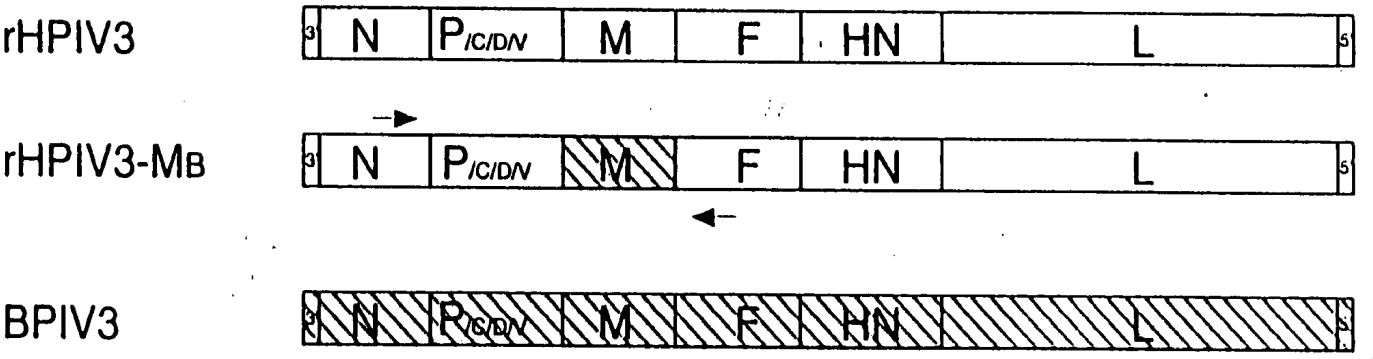


Figure 9A

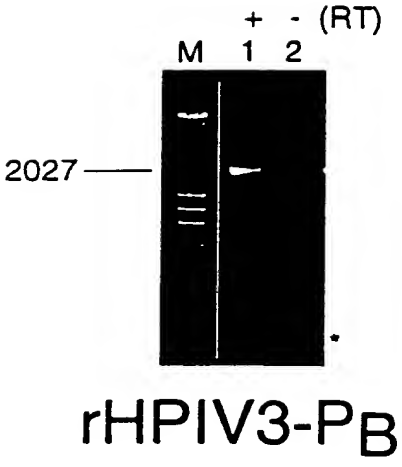


Figure 9B

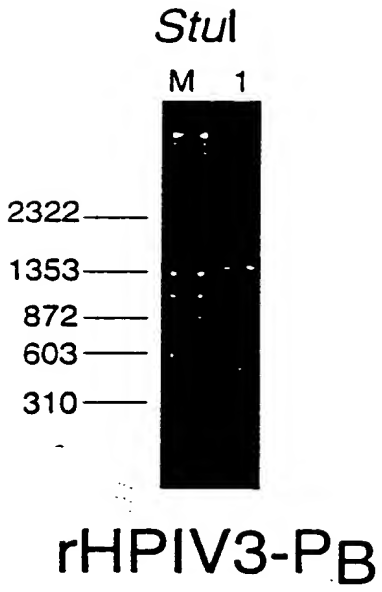


Figure 9C

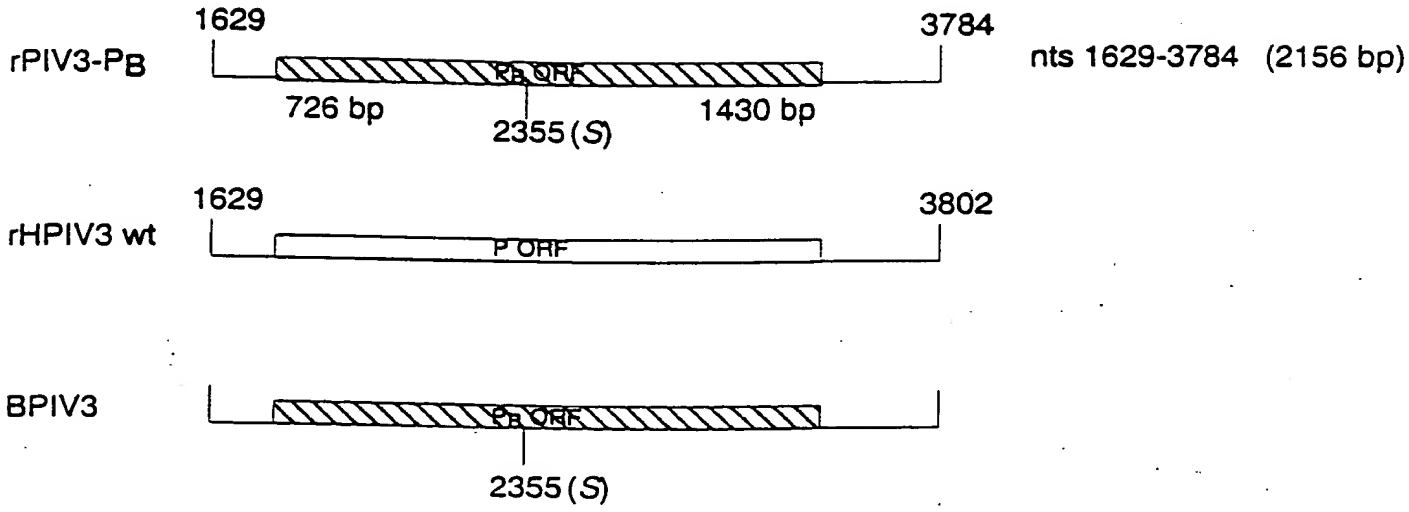
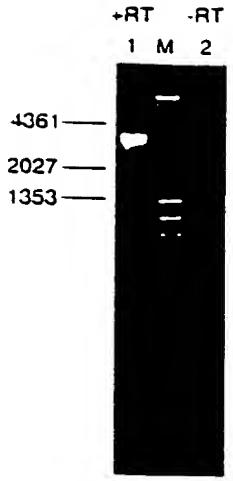
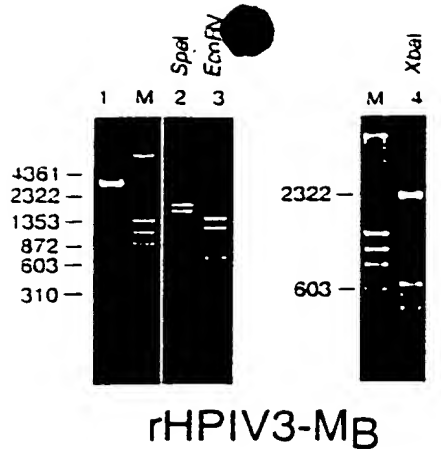


Figure 10A



rHPIV3-MB



rHPIV3-MB

Figure 10B

Figure 10C

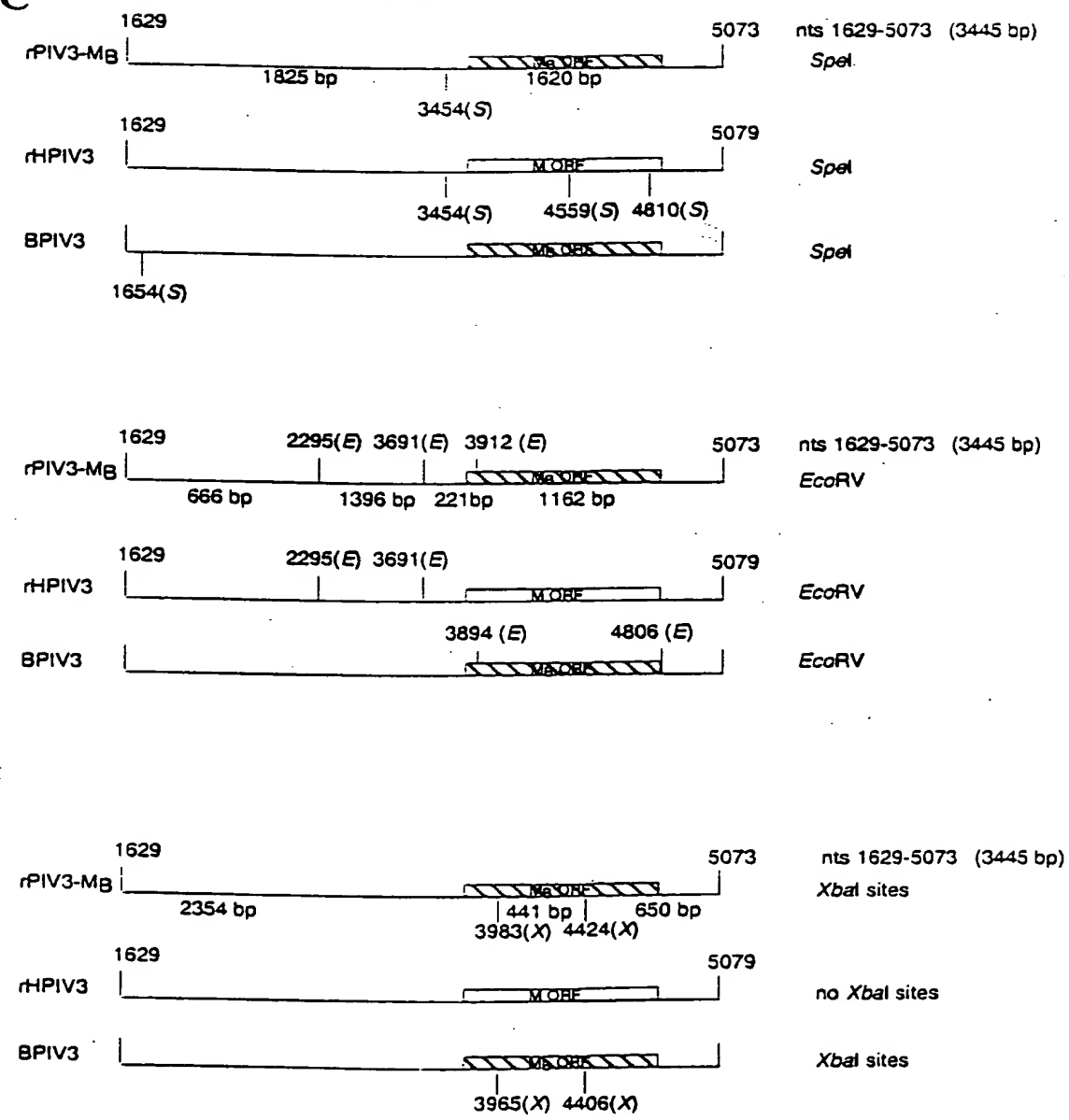


Figure 11A

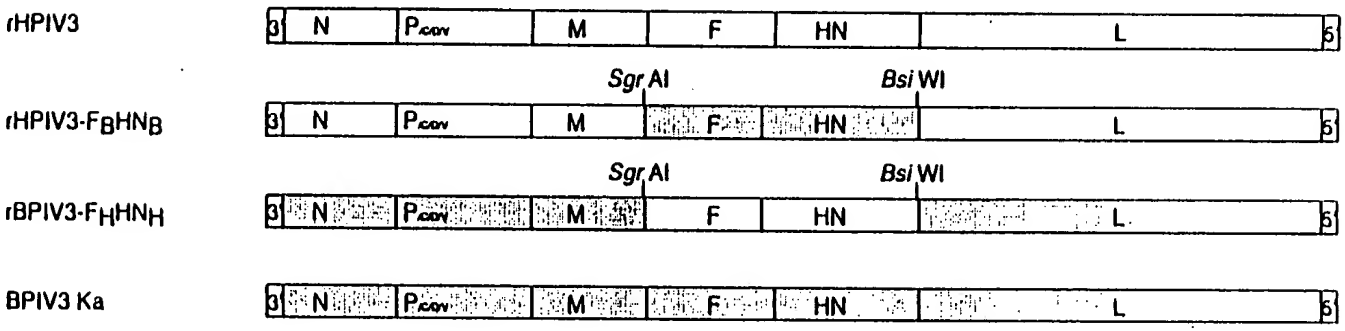

rHPIV3
3'
N
P
C
V
M
F
HN
L
5'
SgrAI
BsiWI
rHPIV3-FBHNB
rBPIV3-FHHNH
BPIV3 Ka

Figure 11B

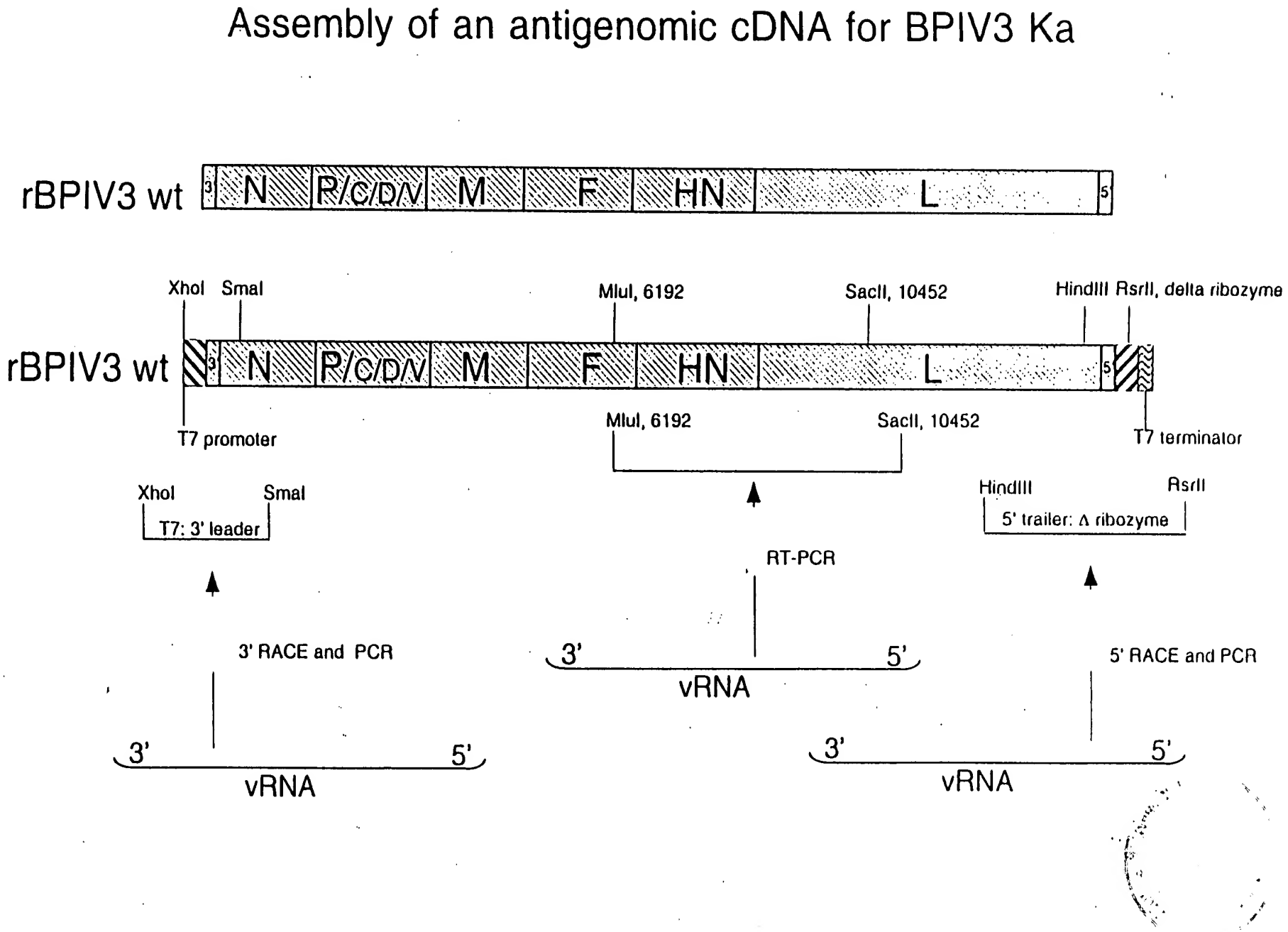
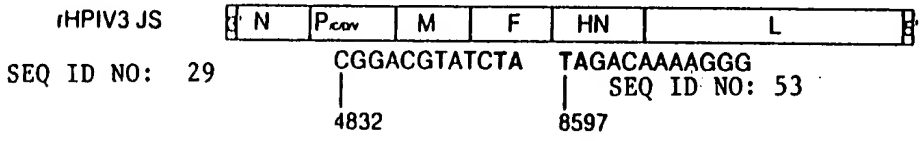
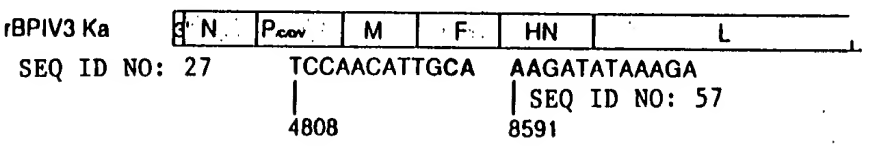

Assembly of an antigenomic cDNA for BPIV3 Ka
rBPIV3 wt
3
N
P/C/D/V
M
F
HN
L
5
XhoI
SmaI
MluI, 6192
SacII, 10452
HindIII RsrII, delta ribozyme
rBPIV3 wt
T7 promoter
MluI, 6192
SacII, 10452
T7 terminator
XhoI
SmaI
T7: 3' leader
HindIII
RsrII
5' trailer: Δ ribozyme
RT-PCR
3' RACE and PCR
3'
5'
vRNA
3'
5'
vRNA
5' RACE and PCR
3'
5'
vRNA

Figure 11C

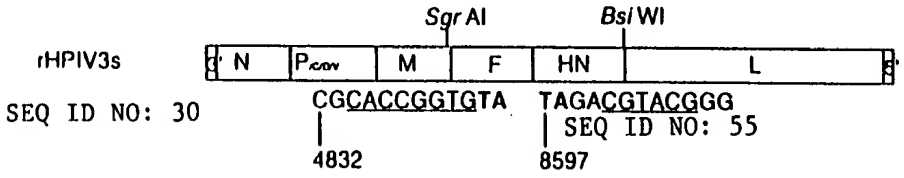
Generation of full length cDNA clones encoding HPIV3/BPIV3 antigenic chimeric viruses

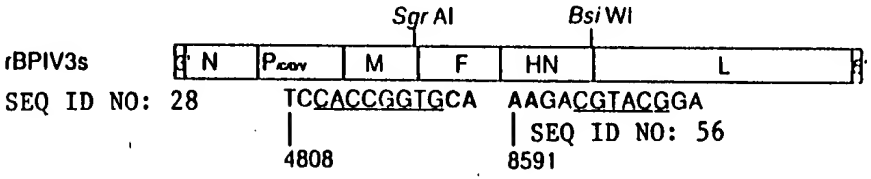
1. Generation of HPIV3 and BPIV3 full length clones



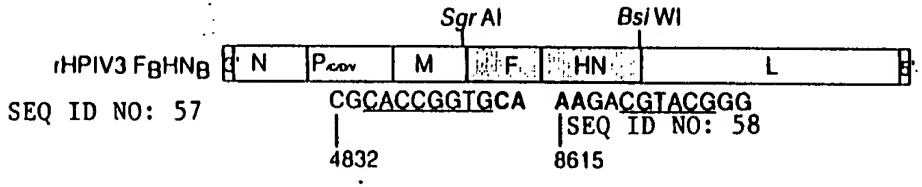


2. Mutagenesis to create uniqueSgrAI and BsiWI restriction sites





3. Cloning of the F and HN genes into the heterologous full length cDNA



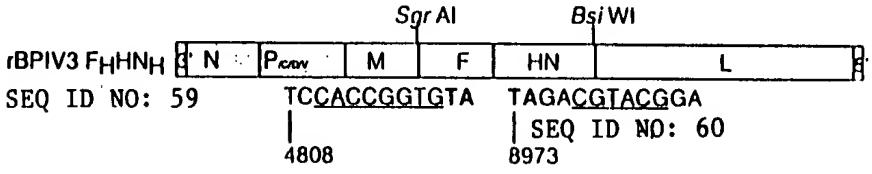
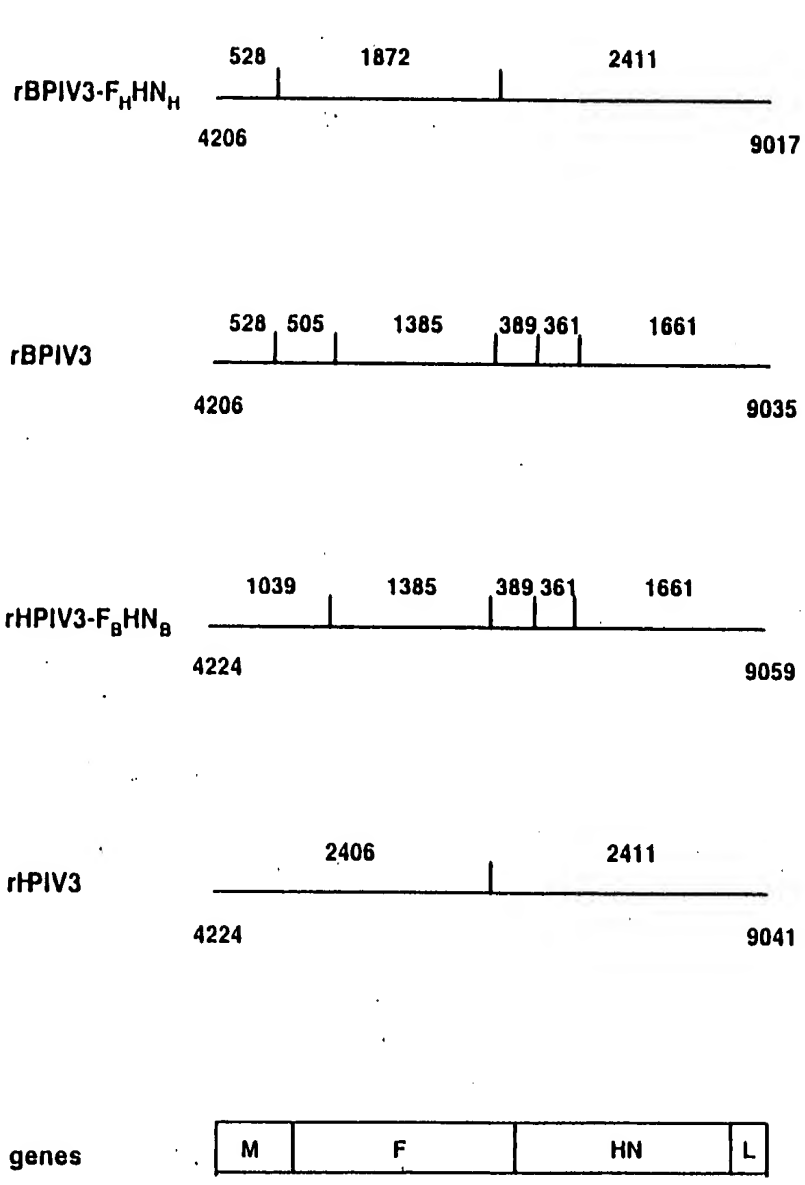


Figure 12


rBPIV3-F$_H$HN$_H$
528
1872
2411
4206
9017
rBPIV3
528
505
1385
389
361
1661
4206
9035
rHPIV3-F$_B$HN$_B$
1039
1385
389
361
1661
4224
9059
rHPIV3
2406
2411
4224
9041
genes
M
F
HN
L

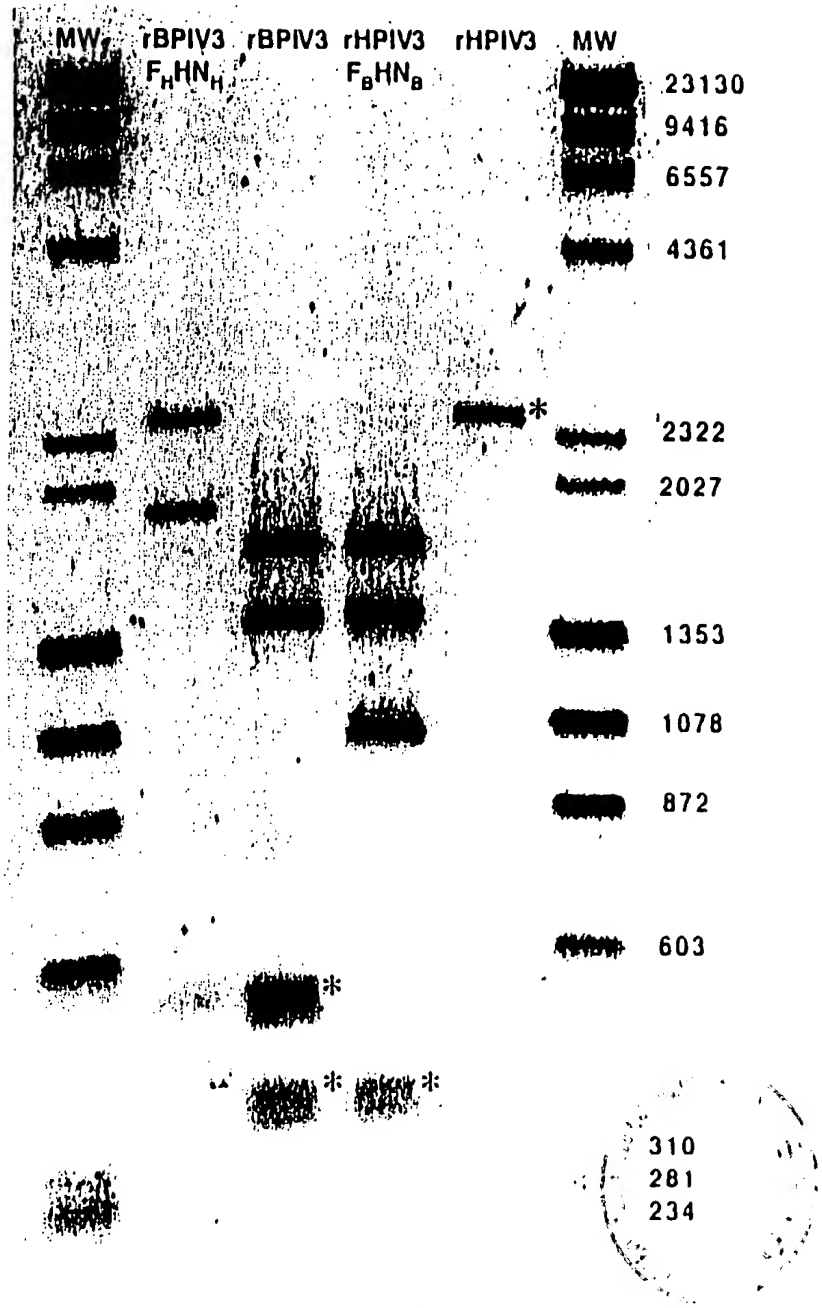

MW
rBPIV3 F$_H$HN$_H$
rBPIV3
rHPIV3 F$_B$HN$_B$
rHPIV3
MW
23130
9416
6557
4361
2322
2027
1353
1078
872
603
310
281
234

Figure 13

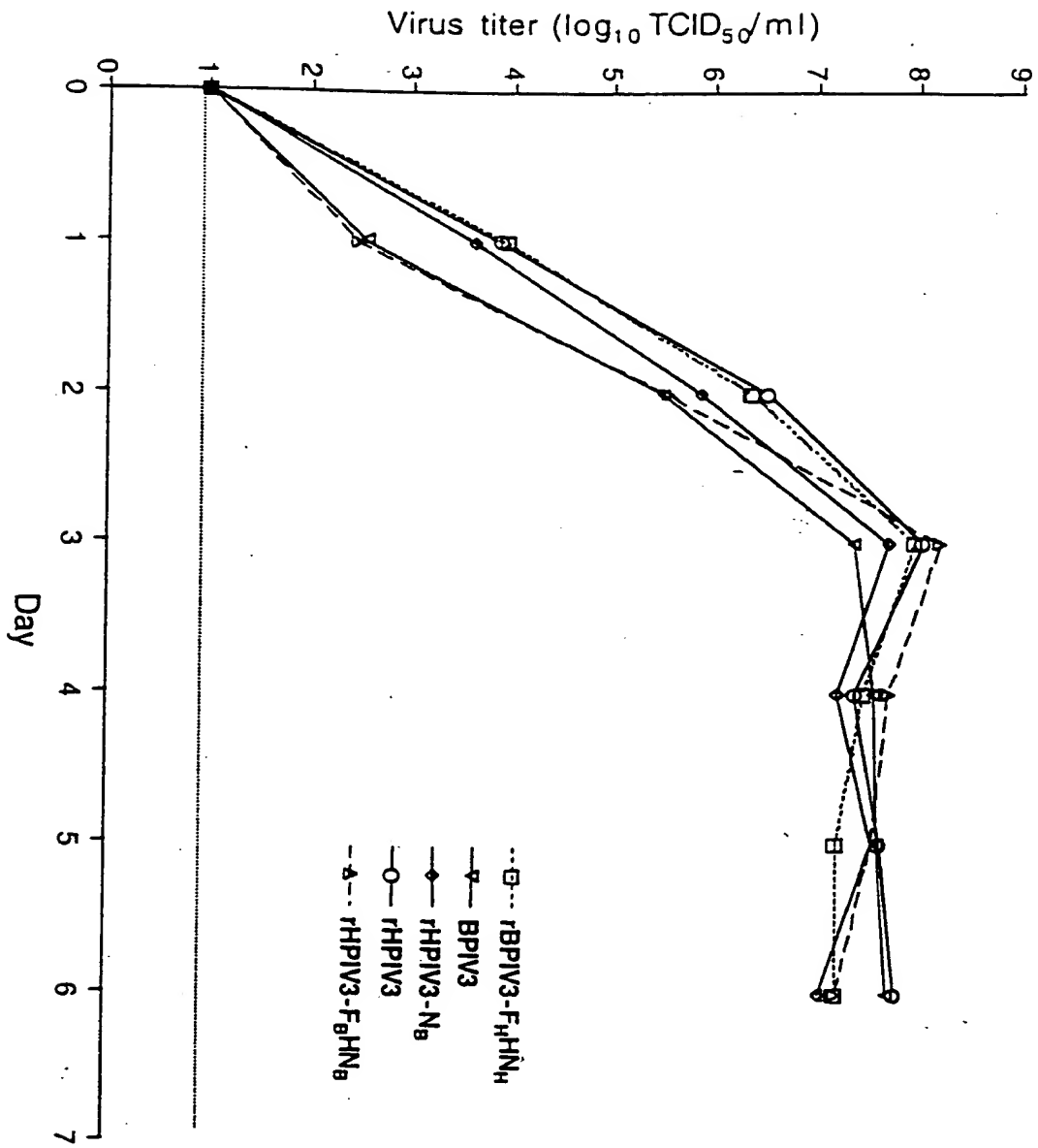

Virus titer (log_{10} TCID$_{50}$/ml)
0
1
2
3
4
5
6
7
8
9
Day
0
1
2
3
4
5
6
7
rBPIV3-F$_H$HN$_H$
BPIV3
rHPIV3-N$_B$
rHPIV3
rHPIV3-F$_B$HN$_B$

Figure 14A

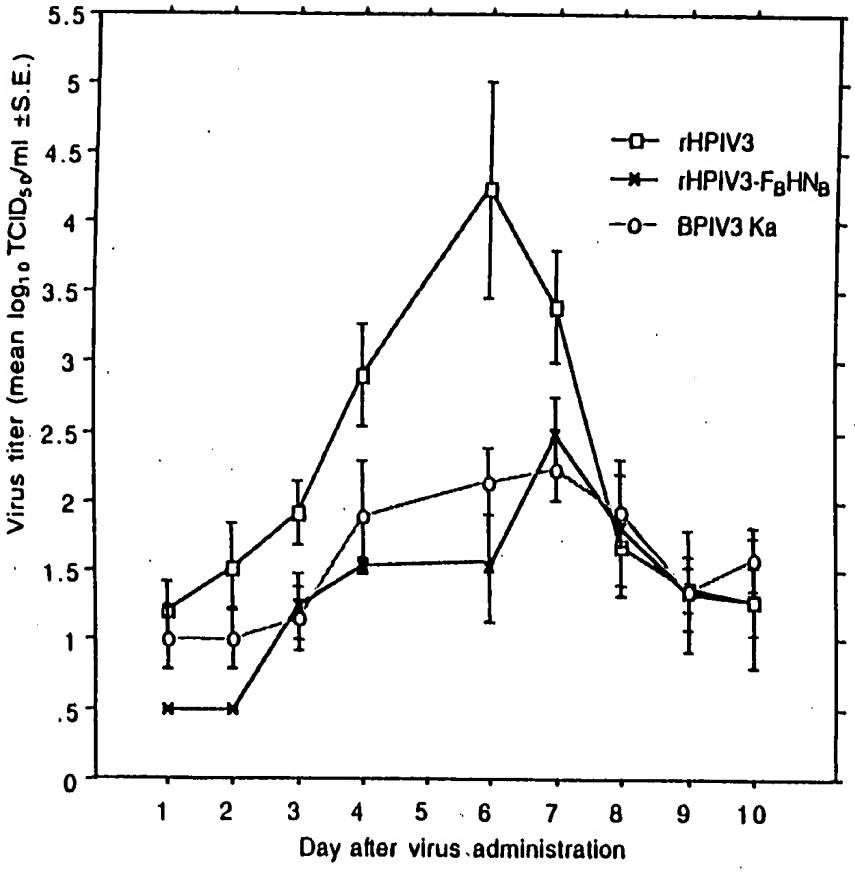
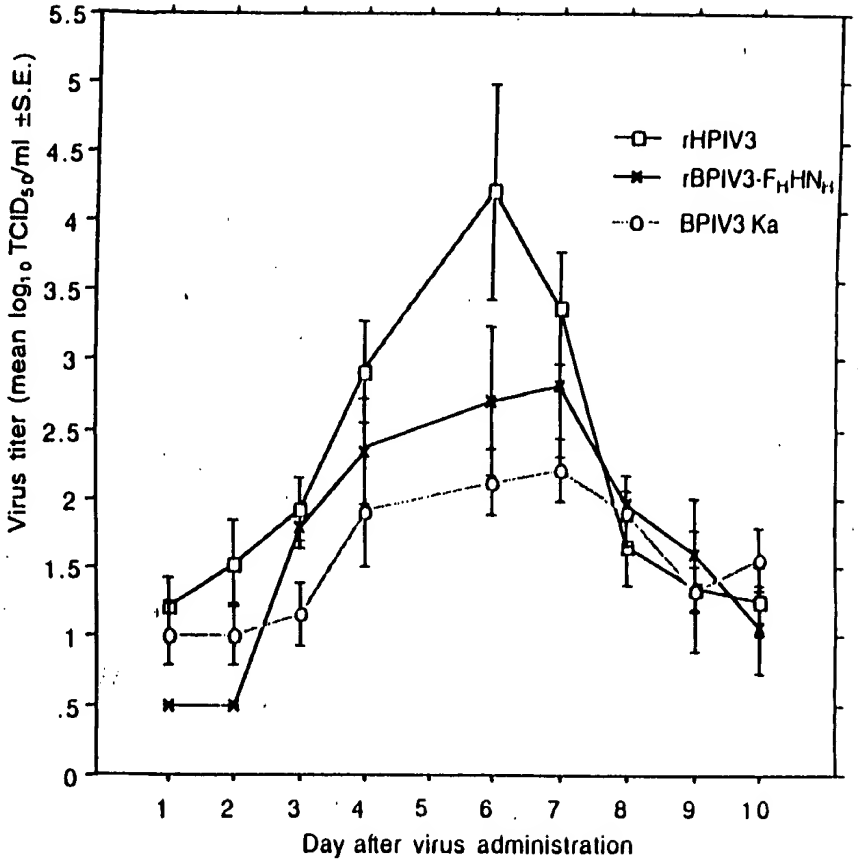


Figure 14B



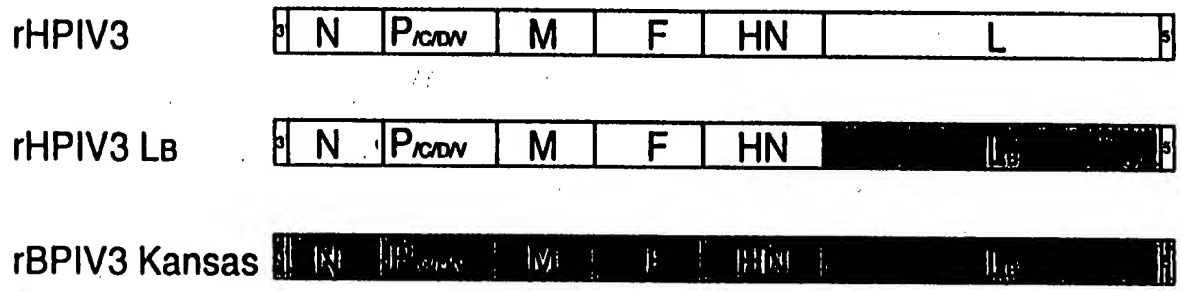


Figure 15

Figure 16

L START

SEQ ID NO: 61	rHPIV3 WT	8623	5'TAGGAGCAAAGCGTGCTCGGGAAATGGACACTGAATCTAACA	3'	8664
SEQ ID NO: 62	rHPIV3 L_B	8623	5'TAGGAGCAAAGCGTGCTCGGGAAATGGACACCGAGTCCCACA	3'	8664
SEQ ID NO: 63	rBPIV3 wt	8617	5'TAGGAGAAAAGTGTGCAAGAAAAATGGACACCGAGTCCCACA	3'	8658

L STOP

SEQ ID NO: 64	rHPIV3 WT	15325	5'ATGATGAATTTGATATCGATTAAAACATAAATACAATGAAGA	3'	15366
SEQ ID NO: 65	rHPIV3 L_B	15325	5'ATAATGAATTTGATATTGATTAATA*CGTACGT*ACAATGAAGA	3'	15366
SEQ ID NO: 66	rBPIV3 wt	15319	5'ATAATGAATTTGATATTGATTAATACATAAAAACATAAAATA	3'	15360